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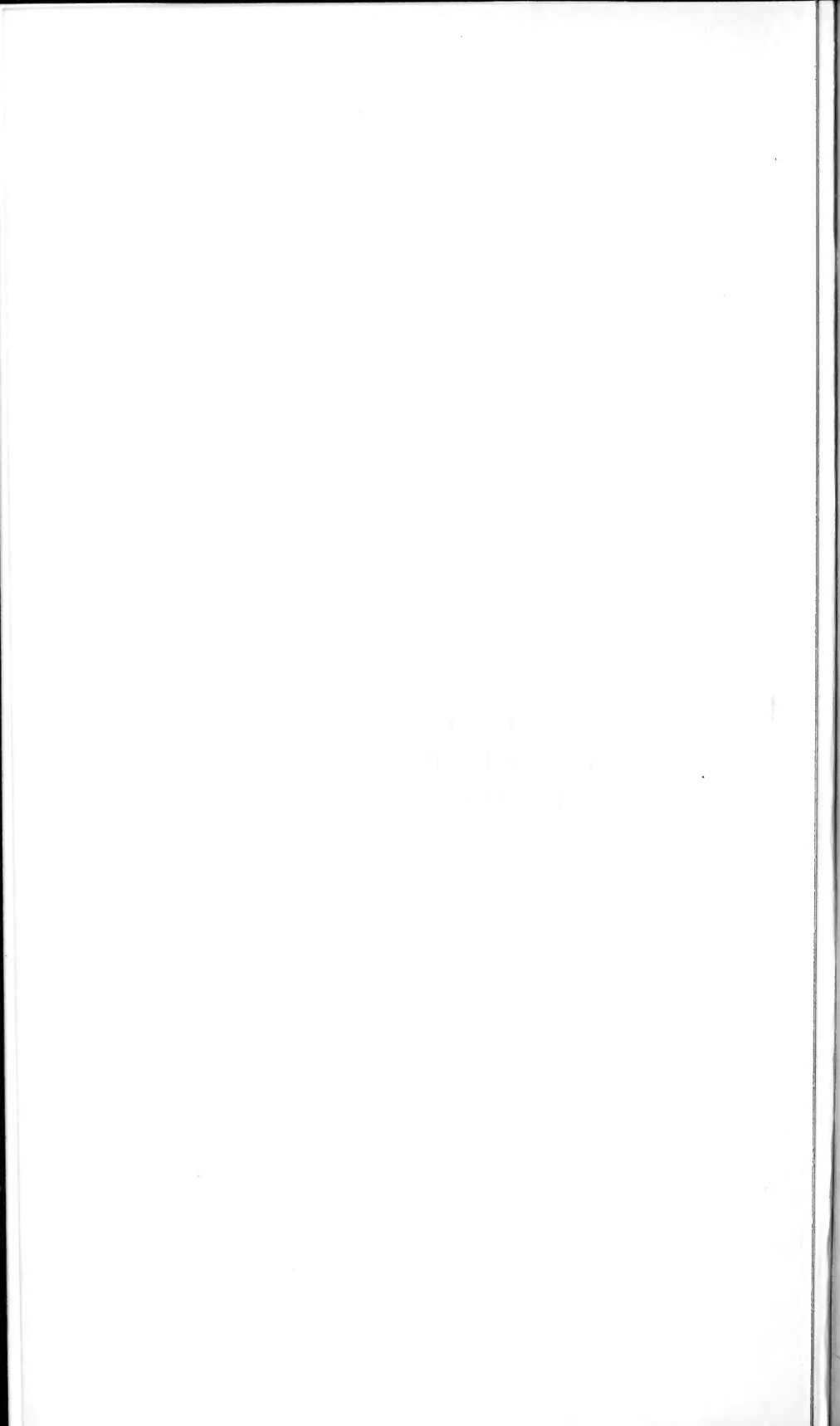
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TRANSACTIONS OF THE
YORKSHIRE NATURALISTS' UNION.

PART 33.

ISSUED TO MEMBERS FOR THE YEAR 1906.

EDITED BY THE HON. SECRETARY.

(SECOND EDITION OF)



NORTH YORKSHIRE :

STUDIES OF ITS

BOTANY, GEOLOGY, CLIMATE, & PHYSICAL GEOGRAPHY.

BY

JOHN GILBERT BAKER,

F.R.S., F.L.S., M.R.I.A., V.M.H.,

Late Keeper of the Herbarium and Library of the Royal Gardens, Kew ;
Late President and Perpetual Vice-President of the Yorkshire Naturalists' Union.

With a Chapter on the Mosses and Hepatics of the Riding,

BY

MATTHEW B. SLATER, F.L.S.

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OF SIXTH (AND FINAL) INSTALMENT (18 SHEETS).

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NORTH YORKSHIRE.

THIS WORK FORMS THE THIRD VOLUME OF THE
BOTANICAL SERIES OF THE
TRANSACTIONS OF THE YORKSHIRE NATURALISTS' UNION.

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EDITORIAL.

IN 1863, Messrs. Longman, Green, Longman, Roberts & Green published "North Yorkshire: Studies of its Botany, Geology, Climate, and Physical Geography," by John Gilbert Baker. This work, which was printed at Thirsk, contains 353 pages and four maps. With the exception of some copies which were sent out to subscribers, &c., the entire edition was unfortunately destroyed by fire at the author's residence. The present "second edition" may, therefore, be looked upon as an entirely new work, and, with F. A. Lees' "Flora of West Yorkshire," published by the Yorkshire Naturalists' Union, and J. F. Robinson's "Flora of the East Riding," published by the Hull Scientific and Field Naturalists' Club, completes the account of the Flowering Plants, Ferns, Mosses, and Hepatics of the county. Masee & Crossland's "Fungus Flora of Yorkshire," and W. & G. S. West's "Alga Flora of Yorkshire," also published by the Union, unquestionably complete a series of works dealing with the Flora of Yorkshire of which any Society might be justly proud.

The present work has been revised and brought up to date throughout; parts have been entirely re-written, and Mr. M. B. Slater has not only increased the number of Mosses recorded for the Riding from 309 to 418, but has

included particulars of numerous additional localities, as well as a list of Hepatics for the Riding (124), which is almost entirely new. The maps in the present edition have also been re-drawn.

It must be gratifying to all to find that Mr. J. G. Baker, who published the first edition so long ago as 1863, has been able to see the present work through the press.

T. SHEPPARD, F.G.S.

THE MUNICIPAL MUSEUM,

HULL, *January, 1906.*

PREFACE

TO THE SECOND EDITION.

THIS Second Edition has been brought out by the Yorkshire Naturalists' Union, and I am very much indebted to the successive Secretaries, Mr. W. Denison Roebuck, F.L.S., and Mr. T. Sheppard, F.G.S., for the pains they have taken in seeing it through the press.

The First Edition was published in 1863, and in January, 1866, I left Yorkshire to become a member of the staff of the Herbarium of the Royal Gardens, Kew, so that what has been done in the field covered by the book since the First Edition was published, has been almost entirely the work of others. I have especially to thank Mr. J. Edmund Clarke and Mr. H. M. Platnauer for revising the chapter on Geology; the late Mr. G. M. Whipple, of the Kew Observatory, for a supplement to the chapter on Climate; and Professor Percival, now of Reading, for revising the account of the Yore drainage district.

Since 1863, only fifteen flowering plants and ferns (not reckoning aliens) have been added to the flora of the Riding; but in mosses the new species and localities are very numerous, and I and my readers are very much obliged to Mr. M. B. Slater for editing this portion of the work, and for adding an account of the Hepaticæ of the Riding, which were very little known at the time the First Edition was published.

J. G. BAKER.

3, CUMBERLAND ROAD,
KEW, *January 8th, 1906.*



PREFACE TO LIST OF MOSSES, &c.

THE list of mosses given by Mr. Baker in the first edition of "North Yorkshire" (1863) was a very good one, 309 species are named that were then known to grow in this division of the county. These were arranged after the method adopted in "Wilson's Bryologia Britannica" (1855), which was at that time the best and most comprehensive work on the British mosses.

The "British Moss Flora," by Dr. R. Braithwaite, F.L.S., is now completed; the first part of which was issued in 1880, and the final part, No. 23, in 1905. This fine work, in 3 volumes, contains the description of 680 species arranged in 118 genera, and is illustrated by beautiful drawings of all the species, which have been recorded in the British Islands.

All students of mosses will be grateful, and must admire the great perseverance of the author, who has been enabled to complete so valuable a work in his 81st year. This will probably be the standard work on these plants for many years. In revising the list of mosses for North Yorkshire, the arrangement and nomenclature adopted by Dr. Braithwaite have been followed.

The moist climate of the British Isles is favourable to their growth, and they are well represented by a large number of species. We have, however, no endemic mosses peculiar to our Islands. The species of the Arctic and Temperate regions of the Globe are the predominating forms, many of these are found to grow throughout the continent of Europe, and extend westward to the Northern United States and Canada, and even into the Southern Hemisphere. In New Zealand some of our British mosses are found, and the late Dr. Spruce, during his explorations in the equatorial regions of

South America, met with British species growing at high elevations on the mountains of the Peruvian Andes.

All the fertile lands in the vale of York and other lowland valleys are highly cultivated by the plough for the growth of cereals and root crops, and the draining of portions for agriculture has destroyed the habitats of some rare species.

A patch of the rare *Paludella squarrosa* was formerly found to grow on the North Car at Terrington, near Castle Howard. This portion of the Car was drained after the wet summer of 1860, and a few years afterwards this rare moss had entirely gone. In the vale of York there are still left some uncultivated tracts of heathery moorland, such as Strensall Common and Stockton Forest, where a good many mosses find a moist suitable soil for their growth, and some rare species are met with. On the wettest portions several Sphagnums grow, and intermingled amongst these are some rare Hepatics. Damp woodlands are suitable places for mosses, and many species are found on the ground under the shade of the trees; and other cortical species may be met with on the stems and branches of the trees. The shady side of walls and rocks, are also places where mosses grow. There are large tracts of uncultivated moorlands, both on the east and west of the great central vale of York, where many of the rarer mosses grow.

Amongst the eastern hills the numerous glens and valleys made by the rivers Rye, Derwent, and their tributaries, are very good localities, and many rare species are found. The Esk and its tributary streams, in which are some deep sheltered glens and waterfalls, is a district rich in Hepatics, where some of the rarest species are met with.

The hills on the western side of the vale of York are the highest. The Micklefell ridge in Upper Teesdale reaches an elevation of nearly 2,600 ft. above sea-level, and is the highest point of Yorkshire. Upper Teesdale is a well known

rich botanical district, and some of the rarest of our flowering plants, as well as mosses, are recorded from this district.

The Upper parts of the rivers Swale and Ure amongst the western hills are also suitable localities, and many interesting species are recorded from the tributary streams in the higher parts of these rivers.

With the aid of several botanical friends who have been studying the mosses and have sent me specimens collected from various districts, many additions have been made to the list of mosses known to grow in North Yorkshire, which now comprises 389 species of *Urn* mosses, and 29 *Sphagnum*s, making a total of 418 species, which is an increase of 109 since 1863. There are also a good many varieties noticed. In addition, a list of 124 species of the *Hepaticæ* is given, none of which were included in the first edition of North Yorkshire. Pearson's "*Hepaticæ of the British Isles*" has been mostly followed for the arrangement and naming of these. The *Hepaticæ* prefer sheltered glens, or grow on moist heathery ground amongst *Sphagnum*s, where there is abundant moisture. Some of the rarest are found in the vicinity of waterfalls, the spray from which constantly keeps them moist.

In August, 1901, Messrs. Jones and Horrell visited Upper Teesdale, and spent nearly a month collecting the *Sphagnum*s which grow very abundantly in the bogs of that elevated moorland region. The results of their investigations are published in the *Journal of Botany* for 1903.* In this account 28 species and 81 varieties are named which had been gathered, and from this list many additions have been made to the flora of North Yorkshire. The annual rainfall on the higher hills at the upper parts of the rivers is much greater on the western hills than on those of

* "*The Sphagna of Upper Teesdale*," by E. C. Horrell, F.L.S., p. 180.

the eastern moorlands ; 50 to 60 inches being recorded from many of the high ridges of the western hills. On the eastern hills the wettest localities rarely have a rainfall of more than 40 inches annually.

Although the list of mosses recorded for North Yorkshire is considerably increased since 1863, it should not be considered a final one. There are large tracts of uncultivated moorlands on both sides of the central vale with suitable habitats for their growth, we may hope that future students of these plants, by the aid of recently published works, may be able to make further discoveries and additions to the Bryology of North Yorkshire.

I must beg to thank all my botanical friends who have so kindly assisted me by sending specimens from the various localities, which have increased the list so much since 1863. The names of the following contributors are given, after the locality recorded, with the dates of their gatherings as far as I have been able to ascertain them.

The late SAMUEL ANDERSON, Whitby.

Dr. R. Braithwaite, Brixton Hill, London.

Mr. R. BARNES, Harrogate, was some years the manager of the public gardens at Saltburn.

Mr. L. J. COCKS, Bromley Hill, Kent (formerly of Harrogate)

Mr. W. INGHAM, B.A., York.

Mr. J. J. MARSHALL, Beverley.

Mr. J. NEEDHAM, Hebden Bridge.

Mr. GEORGE STABLER, Levens, Westmorland.

Mr. GEORGE WEBSTER, York.

Mr. J. A. WHELDON, Walton, Liverpool, formerly resided in York.

ERRATA.

- Page 422, line 13 from foot, *for* "cryptograms" *read* "cryptogams."
- „ 422, line 2 from top, *for* "mosse" *read* "mosses."
- „ 436, line 6 from top, *for* "Irelet" *read* "Ivelet."
- „ 437, line 17 from top, *for* "Wallm." *read* "Wahlnb."
- „ 438, line 11 from top, *for* "attenatum" *read* "attenuatum."
- „ 439, line 18 from top, *for* "Stritum" *read* "strictum."
- „ 440, line 9 from top, *read* "Hedw." in smaller type.
- „ 446, line 15 from foot, *for* "5" *read* "4."
- „ 454, line 4 from foot, *for* "torfaceus" *read* "turfaceus."
- „ 455, line 6 from foot, *for* "setifolus" *read* "setifolius."
- „ 458, line 9 from foot, "Zetterest" should be in smaller type.
- „ 462, line 11 from top, *for* "fugas" *read* "fugax."
- „ 471, line 15 from foot, *for* "Lisdb." *read* "Lindb."
- „ 495, line 8 from top, *for* "Cullidge" *read* "Callidge."
- „ 500, line 10 from foot, *for* "York" *read* "Yore."
- „ 511, line 11 from top, *for* "Punchars" *read* "Punchards."
- „ 516, line 6 from foot, *for* "erythrocarpon" *read* "erythrocarpum."
- „ 541, line 14 from foot, *for* "polycarpon" *read* "polycarpum."
- „ 542, line 14 from top, *for* "subsphæricarpon" *read* "subsphæricarpum"
- „ 551, line 9 from top, *for* "woode" *read* "woods."
- „ 564, line 5 from top, *for* "nitidum" *read* "nitidulum."
- „ 566, line 14 from foot, *for* "Clyind" *read* "Cylindrothecium."
- „ 570, line 12 from foot, *for* "purpuraceus" *read* "purpurascens."
- „ 585, line 6 from top, *for* "acutifolium" *read* "fimbriatum."
- „ 590, line 10 from top, *for* "Wavnst" *read* "Warnst."
- „ 590, line 2 from foot, *for* "incurratus" *read* "incurvatus."
- „ 599, line 5 from foot, *for* "Dum." *read* "Corda."
- „ 600, line 8 from foot, *for* "Ancura" *read* "Aneura."
- „ 606, lines 12 & 13 from foot, *for* "Belpharozia" *read* "Blepharozia."
- „ 608, line 5 from top, *for* "(Q.)" *read* "(L)."
- „ 609, line 10 from top, *for* "N." *read* "W. West."
- „ 616, line 7 from top, *for* "Slope" *read* "Slape."
- „ 628, line 5 from foot, *for* "Lophovia" *read* "Lophozia."
- „ 629, line 8 from foot. *for* "1852" *read* "1882."



upon the limestone scars of the western hills and dales, ascending to the Main Limestone cliffs that crest the western slope of Micklefell, descending to the Yore side at Aysgarth force. See remarks under *Galium sylvestre*.

Aira cæspitosa L. Native. Area general. Range 0-650. Common in thickets and grassy places, ascending to the limestone pavement of Camfell, and the gritstone plateau of Pin Seat.

A. flexuosa L. Native. Area general. Range 0-700. Common upon heaths from the Central Valley upwards to the peak of Lovely Seat.

A. caryophyllea L. Native. Area 8 7 6 5 4 3 2 1. Range 0-300. Frequent upon dry banks throughout the Lower zone, ascending to the edge of the Hambleton plateau near Whitstoncliffe.

A. præcox L. Native. Area 9 8 7 5 4 3 2 1. Range 0-600. Frequent upon sandy heaths, especially amongst the hills, ascending in Swaledale to Hollow mill cross and the plateau of Pin Seat.

Avena sativa L. Commonly cultivated in the low country and up to 350 or almost to 400 yards, and above 200 yards much the most frequent cereal crop. The varieties with a one-sided panicle are most productive in the low country, but the old-fashioned form with a panicle like *A. fatua* is more hardy, and is still often grown upon upland clayey soils.

A. fatua L. Colonist. Area general. Range 0-300. Frequent in cultivated fields, ascending to the Hambleton plateau above Hawaby.

A. pratensis L. including *alpina* Smith. Native. Xerophilous. Area 9 8 7 3 2. Range 0-500. Frequent amongst the limestone hills both upon the east and west of the Central Valley, ascending in Swaledale to the south end of Keasdon, in Teesdale to Cronkley and White Force scars. In the Central Valley by the Tees side between Croft and Dalton.

***Avena pubescens* L.** Native. Area 9 8 7 6 5 3 2 1. Range 0-400. Common in grassy places, ascending in Teesdale to Upper Cronkley.

***A. flavescens* L.** Native. Area general. Range 0-450. Common in grassy places, ascending in Arkendale to the Main Limestone scars of Copperthwaite moor.

***Arrhenatherum avenaceum* Beauv.** Native. Area general. Range 0-450. Common in thickets and upon hedgebanks, ascending to Hell'gill and the Main Limestone scars of Harlen fell.

***Holcus lanatus* L.** Native. Area general. Range 0-600. Common in grassy places, ascending to Hollow mill cross and the peak of Great Wherside.

***H. mollis* L.** Native. Area general. Range 0-450. Frequent in thickets and upon hedgebanks, ascending to the Main Limestone scars of Whitstondale.

***Triodia decumbens* Beauv.** Native. Area general. Range 0-600. Common in grassy places, especially amongst the hills, ascending to the peak of Great Wherside and the plateau of Cronkley fell.

***Koeleria cristata* Pers.** Native. Area 9 8 7 6 5 4 3 2. Range 0-600. Frequent on dry banks, especially amongst the hills, ascending to the plateaux of Cronkley Fell and the south end of Keasdon.

***Melica uniflora* Retz.** Native. Area general. Range 0-350. Common in shaded places throughout the Lower zone, ascending to Shaw's gill above Hardraw force and the Main Limestone scars of the northern slope of Keasdon.

***M. nutans* L.** Native. Montane. Subxerophilous. Area 9 8 7 6 3. Range 100-350. In the west by the Tees side at Winch bridge, on Whitstondale scars, in the Round Howe woods, about the Yore at Aysgarth force, and about the Magnesian Limestone at Thorpe Arch. Amongst the

woods of the eastern calcareous hills in numerous localities; Hawaby bank, Byland woods, Ouldray gill, Sleightholme dale, &c., and in Howardian tract. *Rubus saxatilis* is the nearest geographical ally of this species, so far as North Yorkshire is concerned.

Molinia cœrulea Mœnch. Native. Area general. Range 0-600. Frequent upon damp heaths, ascending from the carrs of the Central Valley to the peak of Great Whernside.

Catabrosa aquatica Presl. Native. Area 9 8 6 5 3 2 1. Range 0-300. Not unfrequent in oozy places in the Lower zone. Brignal, Hartleap well, Richmond, Pickhill, Camphill, Boltby, Gormire, Kildale, Knavesmire, Terrington, Scarbro', Thirsk, Stockton forest, &c.

Glyceria aquatica Smith Native. Area 8 6 5 4 3 2 1. Range 0-150. Frequent in ponds and ditches in the low country.

G. fluitans R. Br. Native. Area general. Range 0-550. Common in watery places both in the low country and amongst the hills, ascending to the plateau of Cronkley fell.

G. plicata Fries, including *G. pedicellata* Towns. Native. Area general. Range 0-400. Frequent in similar situations to the preceding, especially in the low country, ascending to the foot of Preston scar and the upper part of Coverdale.

G. maritima M. & K. Native. Maritime. Area 5 4 3. Range C.L. Common in damp places along the coast line from Middlesbro' to Scarbro'.

G. distans Wahl. Native. Area 7 6 5 4 3 2 1. Range 0-100. Plentiful in the salt-marshes at Middlesbro' and Coatham, and growing also by the Esk side at Whitby and on the north shore at Scarbro'. Inland upon the Magnesian Limestone at Thorp Arch, and in the Central Valley in sandy

ground at Wath and between Heworth and Stockton, Thirsk, Bagby Moor, Carlton Moor, *W. Foggitt!*

Glyceria Borreri Bab. Native. Maritime. Area 5. Range C.L. With the preceding plentiful amongst the salt-marshes near Middlesbro', *Mudd!*

G. procumbens Smith. Native. Maritime. Area 5 4 3. Range C.L. Along the coast line at Middlesbro', Coatham, Runswick Bay, Robin Hood's Bay, and Scarbro'.

G. rigida Smith. Native. Area 8 7 6 5 3 1. Range 0-300. Frequent in dry ground in the Lower zone, ascending to the flagstone quarries of Leyburn moor.

G. loliacea Wats. Native. Maritime. Area 5 3. Range C.L. Amongst the coast sandhills about Coatham and Redcar. At Scarbro' near the old pier, *Bean!*

Poa annua L. Native. Area general. Range 0-800. Everywhere common in grassy places and waste ground, ascending to the Main Limestone of Micklefell.

P. pratensis L. Native. Area general. Range 0-800. Everywhere common in grassy places, ascending to the Main Limestone of Micklefell.

P. trivialis L. Native. Area general. Range 0-500. Common in grassy places and cultivated fields, ascending to Crook Seat, and the Main Limestone scars of Gunnerside gill and Punchard's gill.

P. compressa L., including *polynoda* Parn. Native. Area general. Range 0-300. Frequent upon walls and in dry places throughout the Lower zone, ascending to the flagstone quarries of Leyburn moor.

Poa nemoralis L., including *Parnellii* Bab. Native. Area 9 8 7. Range 100-500. In Teesdale at the falls of Maze beck, upon Cronkley and Holwick scars, and near the Tees at the High force, Winch bridge and Eglestone abbey. In Gretadale at the waterfall below Sleightholme.

In the West Swale district upon the Main Limestone scars of Keasdon, Booze moor, and Copperthwaite moor. In Wensleydale in Shaw's gill and on the rocks below Harddraw force.

Poa Balfourii Parn. Native. Montane. Area 8. Range 350-400. Amongst the Main Limestone scars in the lower part of Whitstondale, with *Hieracium anglicum*, &c.

Briza media L. Native. Area general. Range 0-700. Everywhere common in grassy places, ascending to the limestone edges of the northern slope of Micklefell.

Cynosurus cristatus L. Native. Area general. Range 0-550. Common in grassy places, ascending to Hollow mill cross and the Main Limestone of Keasdon and Booze moor.

C. echinatus L. Alien. Casually subspontaneous in cultivated fields. In a field at Great Ayton, periodically for fourteen years, *Mudd!* Amongst *Lolium italicum* in a field between Ganthorpe, and Terrington, *Ibbotson*.

Dactylis glomerata L. Native. Area general. Range 0-450. Common in fields and upon hedgebanks, ascending the Main Limestone scars of Harlen fell and Copperthwaite moor.

Festuca bromoides L. Native. Area 8 7 5 4 3 2 1. Range 0-300. Frequent in dry sandy ground throughout the Lower zone, ascending to the edge of the Hambleton plateau near Whistoncliffe.

F. pseudo-myurus Will. Native. Area 7 5 3. Range 0-300. In similar situations to the preceding, rare. Amongst the flagstone quarries of Leyburn moor. In Cleveland on Kildale moor, and abundant amongst the Middlesbro' ballast hills. In the Howardian tract in a quarry at Slingsby.

F. ovina L. Native. Area general. Range 0-850.

Common in grassy places, especially among the hills, ascending to the peak of Micklefell.

Festuca duriuscula L. Native. Area general. Range 0-600. Grassy places, much commoner than the preceding amongst the meadows of the low country, but rarer amongst the hills, ascending to the gristone plateau of Pin Seat.

F. rubra L. Native. Area 8 5 4 3 2 1. Range 0-200. Common amongst the coast cliffs and sandhills, and occurring also occasionally inland in sandy ground, ascending in Swaledale to Healaugh.

Festuca elatior Huds. Native. Area general. Range 0-400. Frequent about streamsides both in the low country and in the dales, ascending to Upper Whitfell force.

F. pratensis Huds. including *loliacea* Huds. Native. Area general. Range 0-400. Common in grassy places, ascending in Teesdale to Upper Cronkley.

F. sylvatica Vill. Area 7. Range 0-100. Scottish type. North bank of the Yore opposite Hackfall, *Rev. J. Dickin*.

Ceratochloa unioides DC. Alien. Subspontaneous in considerable abundance in a field near Newtown in Cleveland, 1854, *Mudd!* Indigenous in North America.

Bromus giganteus L. Native. Area general. Range 0-350. Common in woods and thickets, ascending to Shaw's gill near Hardraw.

B. asper L. Native. Area general. Range 0-400. Common in similar situations to the preceding, ascending to Upper Whitfell force and the Main Limestone scars of West Stonesdale moor.

B. sterilis L. Native. Area general. Range 0-250. Common upon hedgebanks in the low country, ascending in Swaledale to the foot of Applegarth scars.

B. tectorum L. Alien. Waste ground near Whitby, 1872, *F. A. Lees*. In the Central valley on Strensall

common, *B. D. Waller*. Casual below Yore mill, Aysgarth. *J. Percival*.

Bromus erectus Huds. Native. Xerophilous. Area 8 7 3. Casual below You mill, Cupgarth, *Percival*. Range 0-150. About the Magnesian Limestone at Nosterfield and in the central Valley of Kirlington. Plentiful upon the calcareous Howardine terrace at Hovingham, Slingsby, and Hildenley.

B. secalinus L. Colonist. Area 8 5 4 3 2. Range 0-150. Not infrequent in cultivated fields in the low country.

B. commutatus Schrad. Native. Area 9 8 5 4 3 2 1. Range 0-300. Frequent in cultivated fields and grassy places throughout the Lower zone, ascending to the Hambleton plateau over Hawnby.

B. mollis L., including *racemosus* L. Native. Area general. Range 0-500. Common in grassy places, ascending to Gale and Tanhill.

B. arvensis L. Alien. Casually subspontaneous in cultivated fields. Upsal castle and between Kilvington and Kirby Knowle, 1855.

Brachypodium sylvaticum Beauv. Native. Area general. Range 0-350. Common in woods and upon hedge-banks throughout the Lower zone, ascending to the lower part of Gunnerside gill.

B. pinnatum Beauv. Native. Xerophilous. Area 6 3 2. Range 0-150. Plentiful about the Magnesian Limestone at Thorp Arch, and on the east at Newburgh, and on the Middle Oolite at Nunnington and Hovingham. Professor Sedgwick writes "This grass is so characteristic of the Magnesian Limestone soil that in some instances, where the lower sandstone is brought by a fault to the level of the yellow limestone, the demarcation may be traced with great exactness by the help of this plant without an excavation."

Triticum caninum Huds. Native. Area general. Range 0-450. Frequent upon hedgebanks, ascending to the scars of the upper part of Hell gill and the Main Limestone cliffs of Punchard's gill.

T. repens L. Native. Area general. Range 0-400. Common upon hedgebanks and in cultivated fields, ascending to the Hambleton plateau over Kewick.

T. acutum. D.C. Native Maritime. Area 5. Range C.L. Amongst the coast sandhills between Redcar and Marske.

T. pungens Pers. Native. Maritime. Area 5. Range C.L. Sandy ground amongst the salt marshes at Middlesbro' and Coatham.

T. junceum L. Native. Maritime. Area 5 4. Range C.L. Amongst the coast sandhills at Middlesbro', Coatham, Marske, and Saltburn.

T. vulgare L. Commonly cultivated in the low country, but rare above 200 yards, and above 300 yards hardly worth growing. In the Central valley especially there is a wide extent of country well adapted for its cultivation, but beyond its limits Oats and Barley are more generally grown than Wheat.

Lolium perenne. L. Native. Area general. Range 0-500. Common in grassy places, and by roadsides both in the low country and amongst the hills.

L. italicum Braun. Alien. Commonly cultivated for forage throughout the Lower zone.

L. temulentum L., including *arvense* With. Colonist. Area 9 8 7 5 4 3 2. Range 0-100. Not unfrequent as a weed of cultivated fields in the low country. Asledale near Helmsley. *W. Foggett*.

L. linicola Sonder. Alien. Found by Mr. Ward in a cultivated field near Catterick bridge.

Elymus arenarius L. Native. Maritime. Area 5 4. Range C.L. Sandy ground amongst the Coatham salt-marshes and near Sandsend.

Hordeum vulgare is commonly cultivated up to 350 yards. For malting purposes the sandy soils of the Central Valley yield the best crops. *Secale cereale* is now grown but rarely, either by itself or intermingled with Wheat.

H. sylvaticum Huds. Native. Xerophilous. Area 9 8 6 3. Range 0-150. On the west in Deepdale, Eglestone abbey and Rokeby woods, in Swaledale near Downholme and about the Magnesian Limestone at Thorp Arch. On the east amongst the calcareous hills in Byland wood, Rievaulx woods, Ouldroy gill, and in the Howardian tract.

Hordeum pratense Huds. Native. Area 8 6 5 3 2 1. Range 0-100. Frequent in grassy places in the low country.

H. murinum L. Native. Area 8 6 5 4 3 2 1. Range 0-150. Frequent in dry ground in the low country, especially along the coast, ascending to the walls of Richmond castle.

H. maritimum With. Native. Maritime. Area 5. Range C.L. Plentiful in the salt marshes at Middlesbro' and Coatham.

Nardus stricta L. Native. Area 9 8 7 5 4 3 2 1. Range 0-850. Common upon heaths at all levels, ascending to the peak of Micklefell.

Lepturus filiformis Trin. Native. Maritime. Area 5 4. Range C.L. Amongst the salt marshes at Middlesbro' and Coatham and also by the Esk side at Whitby.

SUMMARY. Incognits and segregates excluded, 155 species come under this chapter, 9 of which are Aliens, 5 Colonists, and 141 Natives. Of those who come under the two latter categories of citizenship, 142 are plants of the Lower, 73 of

the Middle, and 24 of the Upper zone; and they range under the types of distribution as follows, viz.: British 103, English 26, Scottish 5, Highland 5, Germanic 4, Intermediate 1, Local 2.

APPENDIX A.

INTRODUCED PLANTS OF THE MIDDLESBRO' BALLAST HILLS.

The following is a list of the more noteworthy plants which from time to time have been noticed upon the ballast hills near the mouth of the Tees upon the Yorkshire side of the river. A considerable extent of surface which once was waste ground is now built over, and doubtless a large proportion of the species enumerated have entirely disappeared. The species not otherwise known as plants of North Yorkshire have their names printed in Italics: and all of these, except such as are expressly otherwise localised, are known as Natives or well-established Aliens elsewhere within the limits of Britain.

- | | |
|---|-------------------------------------|
| Papaver somniferum L. | <i>Trifolium subterraneum</i> L. |
| <i>Fumaria confusa</i> Jordan. | incarnatum L. |
| <i>micrantha</i> Lagasca. | striatum L. |
| Iberis amara L. | <i>Vicia villosa</i> Host. Inhabits |
| Lepidium Draba L. | cultivated fields in Scan- |
| ruderale L. | dinavia, Belgium, |
| Camelina sativa Crantz. | France and Southern |
| Erysimum cheiranthoides L. | Europe. |
| Sinapis nigra L. | <i>Vicia lutea</i> L. |
| <i>Reseda Phyteuma</i> L. Native | <i>Bupleurum tenuissimum</i> L. |
| of Belgium, Switzerland, | <i>Fœniculum vulgare</i> Gaertn. |
| France and Southern | Pastinaca sativa L. |
| Europe. | <i>Carduus pycnocephalus</i> L. |
| Melilotus vulgaris Willd. | Native of France and |
| Medicago maculata Sibth. | the shores of the Medi- |
| <i>Trigonella ornithopodioides</i> D.C. | terranean. |

Galactites tomentosa Mærch.

Native of the shores of
the Mediterranean.

Erigeron acris L.

Calendula officinalis L.

Senecio viscosus L.

Specularia hybrida A. D. C.

Chenopodium olidum Curt.

hybridum L.

murale L.

opulifolium Schrad.

A plant of Scandinavia,
Denmark, Belgium and
France.

Schoberia fruticosa Meyer.

Polygonum laxum Reich.

Euphorbia Lathyris L.

Mecurialis annua L.

Asparagus officinalis L.

Digitaria humifusa Pers.

Phalaris canariensis L. var.
picta.

Apera Spica-venti Beauv.

Brachypodium pinnatum

Beauv.

Bromus secalinus var. *in-*
ermis.

CHAPTER XXI.

PTERIDOIDES.

Ceterach officinarum Willd. Native. Xerophilous. Area 7. Range 250. In Wensleydale upon a wall in Mr. Willan's yard at Appersett, *Moore*. Sought for there recently without success by Mr. Wheldon. Gathered lately in the lower part of Wensleydale by Mr. W. Robinson and Mr. Percival.

Woodsia ilvensis R. Br. Incognit. This species has been met with in Teesdale on the Durham side of the river, and is said to have been gathered by the late Mr. Potter, the fern collector, on Cronkley scars.

Polypodium vulgare L. Native. Area general. Range 0-800. Common upon rocks and trees, ascending to the Main Limestone of Micklefell.

P. Phegopteris L. Native. Montane. Area 9 8 7 4 3 2. Range 0-550. Frequent in damp woods amongst the hills upon both sides of the Central Valley, ascending to Cronkley scars and the Main Limestone cliffs of Punchard's gill. In the Central Vale on Buttercrambe moor.

P. Dryopteris L. Native. Montane. Area 9 8 7 5 4 3 2. Range 0-700. In similar situations to the preceding, and equally frequent, but not known in the vales. I have seen it clearly within the Upper zone upon the slope of Micklefell towards Lunedale.

P. Robertianum Hoffm. Native. English type. Xerophilous. Area 9 7. Range 400. In Teesdale on the scars of Cronkley fell, *W. H. Brown*. In the Yore district on the scar above Carperby, *J. Percival*; and of Gayle beck, *F. A. Lees*.

Allosorus crispus Bernh. Native. Montane. Area 9 8 7 3. Range 300-800. Not unfrequent upon the grit-stone edges of the western hills. In Teesdale descending to Lonton, ascending to the Main Limestone of Micklefell. In Lunedale upon crags near the Tarn. In Swaledale, in Whitstondale, and on Raven's Seat moor and the northern slope of Lovely Seat. In the Yore district in several stations; Leyburn moor, Penhill, Great Whernside, &c. On the east upon the sandstone crags of Wainstones.

Cystopteris fragilis Bernh, including *dentata* and *angustata*. Native. Area 9 8 7 6 3 2. Range 0-800. Frequent upon rocks and walls amongst the hills, especially those of the west and of the Middle Oolite, ascending to the Main Limestone of Micklefell, and the limestone pavement of Camfell and Widdale fell. In the Central Vale on walls at Thornton-le-street.

Aspidium aculeatum Swartz. Native. Area general. Range 0-800. Common in shaded and rocky places, ascending to the Main Limestone of Micklefell.

A. angulare Smith. Native. Area 8 7 6 5 4 3 2. Range 0-300. Frequent in similar situations to the preceding throughout the Lower zone.

Lastrea Thelypteris Presl. Native. Area 6 4 3. Range 0-100. Rare in swampy woods in the low country. Plentiful in Askham bogs and Terrington carr, and on Buttercrambe moor. It grew formerly in Holly hill bogs near Castle Howard, and is reported by Archdeacon Peirson from Danbydale.

L. Oreopteris Presl. Native. Area 9 8 7 5 4 3 2 1. Range 0-550. Frequent upon heaths, especially amongst the hills, ascending to Cronkley scars, from the commons at Stockton and Strensall.

L. Filix-mas Presl. Native. Area general. Range 0-800.

Common in woods and amongst rocks, ascending to the Main Limestone of Micklefell.

Lastrea cristata Presl. Native. Area 6. Range 50. South end of Askham bogs, discovered by Mr. Thornton in 1873.

L. spinulosa Presl. Native. Area 8 6 5 4 3 2 1. Range 0-200. Frequent in the low country woods, especially in the carrs of the Central Valley, ascending to Arncliffe woods near Egton bridge.

Var. **L. uliginosa** Newm. Has been found by Mr. R. Miller Christy in Askham bog, and in Stockton woods; and by Mr. Le Tall on the edge of Strensall common.

L. dilatata Presl. Native. Area general. Range 0-800. Common in woods and amongst rocks, ascending to the peak of Dodfell, the gritstone edges of Lovely Seat, and the Main Limestone of Micklefell. *L. collina* Newm. has been found by Mr. Mudd in the neighbourhood of Great Ayton.

L. Fœnisecii Wats. Native. Area 4 3. Range 0-150. In Cock Mill Woods near Whitby, and in the wood on the east side of the dale of Derwent at Everley near Hackness. Reported lately from Strensall on the authority of Miss Milner.

Athyrium Filix-fœmina Roth including *rhaeticum* and *molle*. Native. Area general. Range 0-550. Common in shaded woods and amongst rocks, ascending to Cronkley and White force scars, and the Main Limestone cliffs at Punchard's gill.

Asplenium viride Huds. Native. Montane. Area 9 8 7 3. Range 200-800. Frequent amongst the western hills, especially upon the limestone scars. In Teesdale it descends to Lonton, and ascends to the Main Limestone of Micklefell. In Deepdale it grows upon the rocks in the upper part of the glen, and in Lunedale upon the crags in the neigh-

bourhood of the Tarn. In the West Swale district in Whitstondale, Punchard's gill, and at Keasdon force, and down the dale as far east as Aislabeck near Richmond. Hell gill, and numerous stations in Wensleydale, ascending to the Limestone pavement of Widdale fell and Camfell. On the east in two or three of the glens of the Hambleton range near Hawaby.*

Asplenium Trichomanes L. Native. Area 9 8 7 5 4 3 2. Range 0-500. Frequent upon walls and rocks, especially amongst the hills, ascending to Blea beck scars and the Main Limestone cliffs of Harlen fell and Booze moor.

A. marinum L. Native. Maritime. Area 3. Range C.L. Amongst the coast cliffs at Burniston Wyke near Scarbro'.

A. Adiantum-nigrum L. Native. Area 9 8 7 5 4 3 2 1. Range 0-450. Frequent upon walls and rocks, especially amongst the hills, ascending to the Main Limestone cliffs at Harlen fell.

A. Ruta-muraria L. Native. Area general. Range 0-650. Frequent upon walls and rocks, ascending to the limestone pavement of Widdale fell.

Scolopendrium vulgare Sym. Native. Area 9 8 7 6 5 4 3 2. Range 0-450. Frequent in rocky places, especially amongst the hills, ascending to the Main Limestone scars of Copperthwaite moor.

Blechnum boreale Swartz. Native. Area 9 8 7 5 4 3 2 1. Range 0-850. Common upon heaths, ascending to the peak of Micklefell.

Pteris aquilina L. Native. Area general. Rang 0-601. Frequent in the less cultivated tracks, both in the low country and amongst the hills, up to as high as the upper limit of the Agrarian region. The highest stations in which I have seen

* Closely allied to *Allosorus* in its North Yorkshire distribution. Both are frequent ferns throughout the western range of hills, and both occur very sparingly in the east. But whilst the *Asplenium* specially affects the scars of limestone, the *Allosorus* is usually to be met with upon edges of gritstone, either Millstone Grit proper or the bands of Gritstone which are interpolated between the terraced limestones of the Yoredale series.

it are on the spur of hill on the west of the White Force, and on the gritstone edges over Raven's Seat and Crook Seat.

Hymenophyllum Wilsoni Hook. Native. Area 3. Range 100-200. Rocks by the side of the stream in the upper part of Farndale, *Mudd!* *H. Tunbridgensis* is said to have been found by Mr. Peterkin on the banks of the stream which falls into the sea at Hayburn Wyke; and one of the species is reported from a glen near Mickleton. At Eskdale side a Moss was mistaken for the Fern.

Osmunda regalis L. Native. Area 8 6 4 3 2. Range 0-150. Swampy woods in the low country, rare. In the Central Valley in Newby woods near Topcliffe, and plentiful in Askham bogs. Amongst the eastern hills in several stations; Wheeldale, Walking mill foss, Beck hole (now extinct), Mulgrave woods, Forge valley and Barnescliffe near Scarbro'.

Onoclea sensibilis L. Incognit. Formerly subsontaneous in the Ainsty in a lane near Moreby, but now extinct, *Baines*.

1. **Botrychium Lunaria** Sw. Area general. Range 0-550. Frequent in grassy places and upon heaths, ascending in Teesdale to the banks of Maze beck, in Arkendale to the Copperthwaite leadmines and the peak of Booze moor.

1. **Ophioglossum vulgatum** L. Native. Area 8 7 6 5 4 3 2 1. Range 0-350. Frequent in meadows in the low country.

1. **Lycopodium clavatum** L. Native. Area 9 8 7 5 4 3 2 1. Range 0-850. Frequent upon heaths, ascending from Stockton forest and Strensall common to the peak of Micklefell.

1. **L. inundatum** L. Native. Area 6 3 2 1. Range 0-100. In many places amongst the swampy heaths of the low country. Askham bog, Pilmoor, Stockton forest, Strensall common, Welburn moor, Terrington carr.

4. **L. alpinum** L. Native. Montane. Area 9 7 5 4 3. Range 200-850. Frequent amongst the higher hills both of the east and west, ascending to the peak of Micklefell, descending to Hutton Bushel moor near Hackness.

1. *L. Selago* L. Native. Montane. Area 9 8 7 5 4 3 1. Range 0-850. Frequent amongst the higher hills, ascending from the vale heaths to the peak of Micklefell.

4. *L. selaginoides* L. Native. Montane. Area 9 8 7 3 2 1. Range 0-750. Frequent in oozy places amongst the western hills, ascending to the springs of the northern slope of Micklefell, descending to Woodhall and the Yore side at Aysgarth force. In the Central Valley on Stockton forest, and Strensall common, and in the Howardian tract on Welburn moor and Terrington carr. Amongst the eastern calcareous hills in a few stations; Hambleton End, Whitstoncliffe, Hackness moor, Cloughton moor.

1. *Pilularia globulifera* L. Native. Area 8 3 2 1. Range 0-150. Ponds and swamps in the low country in several places. In a brickpond near Leeming Lane, abundant in Gormire, Scarbro' mere, Strensall common, and in several other places upon the vale heaths. Reported also from the neighbourhood of Great Ayton.

2. *Equisetum Telmateia* Ehrh. Native. Area 9.8 7 5 4 3 2 1. Range 0-400. Frequent in swampy woods and thickets, ascending to Clough wood in Fossdale and Shaw wood in Arkendale.

3. *Equisetum umbrosuffi* Willd. Native. Montane. Area 9. Range 250-300. In Teesdale by the stream side from Lower Cronkley bridge as far down as Middleton.

1. *E. arvense* L. Native. Area general. Range 0-550. Common in cultivated fields and waste places, ascending to Hollow mill cross and above the Main Limestone in Pun-chard's gill.

1. *E. sylvaticum* L. Native. Area general. Range 0-400. Frequent in damp woods and meadows, especially amongst the hills, ascending to the upper part of Coverdale and Mossdale.

1. *E. palustre* L. Native. Area general. Range 0-650. Common in damp places, ascending to the tarn end of the hill on the north of Hollow mill cross.

1. *E. limosum* L., including *fluviatile* Fries. Native. Area general. Range 0-600. Common in ponds and slow streams, ascending to the reservoir of a deserted lead working on the plateau of Pin Seat.

3. *E. hyemale* L. Native. Area 8 4 3 2 1. Range 0-200. In the west on the banks of Barnaby beck near Reeth, and by the Swale side at Easby. In the Central Valley at Raskelf. Hazel bush near Strensall and between Topcliffe and Thorpfield. In the east in Goathland dale and Eskdale (Grosmont), at Hackness, Hayburn Wyke, Coneysthorp, Crambeck, very fine at Lofthouse, and by the Derwent side opposite Kirkham.

3. *E. variegatum* Schl. Native. Montane. Area 9 7, Range 250-600. In Teesdale ascending to the plateau of Cronkley fell, descending to the Tees side at Middleton. In Wensleydale at Aysgarth force and Bain gill, Semerdale.
F. A. Lees.

SUMMARY. In this chapter 44 species are included, all of which are Natives. 41 are plants of the Lower, 30 of the Middle, and 15 of the Upper zone; and they range under the types of distribution as follows, viz. :—British 25, English 8, Scottish 5, Highland 4, Atlantic 2.

TOTAL SUMMARY OF THE FLOWERING PLANTS AND FERNS.

Classifying the plants of North Yorkshire according to their categories of citizenship as in the list now completed, we obtain the following result :—

Natives	884	Denizens	37
Colonists	84	Aliens	175
			<hr/>
			1180

Classifying the Natives, Colonists, and Denizens according to their types of distribution, we obtain the following result :—

British type ...	527	Germanic type ...	40
English „ ...	307	Atlantic „ ...	7
Scottish „ ...	47	Intermediate ...	34
Highland „ ...	32	Local „ ...	11
			<hr/>
		Total ...	1006

THE MOSSES AND HEPATICÆ OF NORTH YORKSHIRE.

REVISED BY MATTHEW B. SLATER, F.L.S.

THE name moss is widely applied in popular language, being given to Club mosses (*Lycopodiums* and *Selaginellas*), Urn Mosses (*Muscineæ*), Liver-worts (*Hepaticæ*), Fresh water and Sea Weeds (*Algæ*), Lichens and Fungi, and even sometimes to small tufted flowering plants as the Mossy Saxifrages (*Saxifraga hypnoides*) and the Golden Moss, by which common name the *Sedum acre* or Yellow stonecrop is known.

The "**Historia Muscorum**" of Dillenius, who was the first Sherardian professor of Botany in the University of Oxford, was published at Oxford in 1741. Afterwards it was reprinted in Edinburgh in 1811. This is the most comprehensive early work published in Britain. In this work all the plants of simple cellular structure then known are described, and, to some extent, the whole are put into a natural arrangement, commencing with the lower forms of the Fresh water weeds (*Algæ*).

It comprises 20 Genera with a total of 600 species and varieties. This book was published before Linneus introduced his artificial classification of plants.

As it may be interesting, I give a short abstract of the work of Dillenius from the reprinted copy of his work published in 1811, giving the names of the genera with the number of species to each, and one description of each as

an illustration of the method of naming plants before the Linnean binomial system was introduced. Several of the generic names in the "Historia Muscorum" are still used. The book is in the Latin language, but a short description is given in English to every species.

Genus 1. Byssus—*latissima papyri instar super aquam expansa.*

The green paper Byssus. (*Dill. His. Musc., page 2, Tab. 1*).
20 species of Byssus are given.

Genus 2. Conferva—contains 48 species.

Conferva fluviatilis sericea, vulgaris et fluitans. Hairy river-weed, crow-silk, or floating silk conferva. (*Dill. His. Musc., page 12, Tab. 2 to 7*).

Genus 3. Tremella.—17 species.

Tremella marina vulgaris, lactucæ similis. Oyster green or Laver. (*Dill. His. Musc., page 41, Tab. 8 to 10*).

The above 3 genera comprise what are now classified as Fresh water Algæ and seaweeds.

Genus 4. Usnea.—14 species.

Usnea vulgaris, loris longis implexis, Stringy tree-moss or Usnea of the shops. (*Dill. His. Musc., page 56, Tab. 11 to 13*).

Genus 5. Coralloides.—39 species.

Coralloides fungiforme carneum, basi leprosa. The flesh coloured mushroom-like coralloides. (*Dill. His. Musc., page 76, Tab. 14 to 17*).

Genus 6. Lichenoides.—135 species.

Lichenoides crusta tenuissima peregrinis velut literis inscripta. The strange charactered Lichenoides. (*Dill. His. Musc., page 125, Tab. 18 to 30*).

Genera 4, 5, and 6 contain what are now classified as Lichens mainly.

Genus 7. Mnium.—8 species.

This genus commences the group of Urn Mosses (Muscineæ), all of which are comprised in a total of 8 genera in the Hist.

Musc. *Mnium perangustis et brevibus foliis*. The common narrow-leaved *Mnium*. (*Dill. His. Musc.*, page 230, *Tab. 31*)=*Orthopyxis androgyna* (L.) P. Beauv.

Genus 8. Sphagnum.—In this genus 13 species are given, of which only 2 are true *Sphagnums*.

1. *Sphagnum palustre molle deflexum*, squamis cymbiformibus. The larger soft and hollow-leaved Bog *Sphagnum*. (*Dill. His. Musc.*, page 240, *Tab. 32*).

Genus 9. Fontinalis.—5 species.

1. *Fontinalis triangularis major complicata*, e foliorum alis capsulifera. The common large triangular *Fontinalis*. (*Dill. His. Musc.*, page 254, *Tab. 33*).

Genus 10. Hypnum.—76 species.

1. *Hypnum taxiforme exiguum*, versus summitatem capsuliferum. The least yew-leaved *Hypnum*. (*This is the Fissidens bryoides of later works*). (*Dill. His. Musc.*, page 262, *Tab. 34 to 43*).

Genus 11. Bryum.—81 species.

1. *Bryum capillaceum*, capsulis sphaericis. The hair-leaved Globe *Bryum* (*now known as Bartramia pomiformis* (L.) Hedw. (*Dill. His. Musc.*, page 339, *Tab. 44 to 53*)).

Genus 12. Polytrichum.—12 species.

1. *Polytrichum quadrangulare vulgare*, *Juccæ foliis serratis*. The common bigger square-headed Bog *Polytrichum*, or great Goldilocks. (*Dill. His. Musc.*, page 420, *Tab. 54 and 55*).

Genus 13. Selago.—5 species.

Selago vulgaris, *Abietis rubrae facie*. The common Spruce-like *Selago*. Upright Fir moss, Ray. (*Dill. His. Musc.*, page 435, *Tab. 56 and 57*).

Genus 14. Lycopodium.—11 species.

1. *Lycopodium vulgare pilosum*, amfragosum et repens. The common hairy rambling *Lycopodium*. Club moss or Wolf's-claw. (*Dill. His. Musc.*, page 441, *Tab. 58 to 63*).

Genus 15. Porella.—1 only.

1. *Porella pinnis obtusis*. The blunt finned *Porella*. This is now included amongst the *Hepaticæ*. (*Dill. His. Musc.*, page 459, *Tab. 78*).

Genus 16. Selaginoides.—1 species.

Selaginoides foliis spinosis. The prickly *Selaginoides*. Seedling Mountain Moss. (*Dill. His. Musc.*, page 460, *Tab. 68*).

This is now the *Selaginella selaginoides* Gray. The only British species.

Genus 17. Lycopodioides.—12 species.

These are now classed as *Selaginella*. The genus is an exotic one, and many beautiful species have been introduced from tropical countries, and are now much cultivated as ornamental plants in hothouses. (*Dill. His. Musc.*, page 462, *Tab. 64 to 68*).

Genus 18. Anthoceros.—5 species.

1. *Anthoceros foliis minoribus, magis laciniatis*. The common smaller and more divided *Anthoceros* = *Anthoceros punctatus* L. (*Dill. His. Musc.*, page 476, *Tab. 68*).

Genus 19. Lichenastrum.—50 species.

1. *Lichenastrum Alpinum purpureum, foliis auritis et cochleariformibus*. The purple spoon-leaved Alpine *Lichenastrum*. (*Dill. His. Musc.*, page 479, *Tab. 69 to 74*).

The genus *Lichenastrum* represents what is now known as the Scale Mosses or *Hepaticæ*, of which upwards of 200 kinds are now named and described, found in the British Islands.

Genus 20. Lichen.—19 species.

This group includes the genera *Marchantia*, *Targionia*, *Sphærocarpus* and *Riccia* :—

1. *Lichen vulgaris major pileatus et verrucosus*. The common Mushroom-headed Liverwort = *Fegatella conica*. *Tab. 75*.

6. *Lichen fontanus major, stellatus æque ac umbellatus, et cyathophorus* = *Marchantia polymorpha*. *Tab. 77*. (*Dill. His. Musc.*, page 515, *Tab. 75 to 78*).

Dillenius was born at Darmstadt 1687, came to England 1721, edited Ray's synopsis 3 ed. 1724, Hortus Elthamensis 1732, Historia Muscorum 1741. (*Biographical Index of British and Irish botanists by Britten and Boulger, 1893*).

The figures of the mosses given in His. Musc. of Dillenius are all drawn the natural size of the plants, the engravings are so good that many of the larger mosses can be recognised. Dr. R. Richardson, of North Bierly, near Bradford, was a correspondent of Dillenius, and some localities for mosses are given for the West Riding in the Hist. Musc.; none, however, are recorded for North Yorkshire.

Four Fasciculi of Cryptogamic plants were published in London by **James Dickson**.

Fasc. 1, published in **1785** contains the description of 14 Mosses and 6 Hepaticæ. On Tab. 1 are drawings of some of the mosses and 1 Hepatic, all of the natural size of the plants. **Fasc. 2**, published **1790** contains 37 Mosses and 4 Hepatics. In **Tab. 4** of this Fasc. several figures are given with magnified drawings of dissections of the leaves of both mosses and Hepatics, which are probably the first magnified figures of these minute plants engraved in England. **Fasc. 3**, published **1793** contains 37 mosses and 4 Hepatics. **Fasc. 4**, published **1801** contains 57 mosses and 4 Hepatics. In this fasciculus there is a small moss named *Bryum paucifolium*, which is recorded from Yorkshire, gathered near Wetherby. A figure of the moss is given on Tab. 11. This moss has not been met with since near Wetherby. It is found in Kent. In the spring of 1894 Mr. J. Marshall met with it abundantly near Market Weighton, in the East Riding of Yorkshire, growing on loose blocks of chalk rock, at the base of a railway embankment. It is a minute moss, belonging to the family Dicranaceæ, now named *Seligeria paucifolia* (*Dicks.*) *Carruthers*, and is a most interesting re-discovery of a Yorkshire moss, although in another part of the county.

It has hitherto escaped detection in North Yorkshire, but should be looked for in the dry limestones of that district.

In 1753 Linneus introduced his artificial classification of plants. By it all flowering plants are arranged into 23 classes by the number and position of the stamens and pistils, the reproductive organs of the flowers. Linneus named his 24th class **Cryptogamia**, in which was included all non or hidden flowering plants, such as Ferns, Mosses, Fresh water weeds and Sea-weeds, Lichens and Fungi. Cryptogamic plants far exceed in number the flowering or Phanerogamic plants of the British Islands. By the more natural arrangement these numerous forms of vegetable life have been divided into three main groups.

The 1st group.—**Thall'ophyta**. The vegetative body in these plants is a thallus or simple grouping of cells, without separation into stem, leaf, and root; or if at all in a very rudimentary condition. This section contains the Sea-weeds and fresh-water Algæ, the Lichens and the Fungi.

The 2nd group.—**Bryophyta**. The plants forming this group are the Urn Mosses (*Muscineæ*), the Sphagnums or Bog Mosses (*Sphagnaceæ*), and the Liver-worts or Scale Mosses (*Hepaticæ*).

The 3rd group.—**Pteridophyta** (Vascular cryptograms) contains the Ferns, Horsetails (*Equisetums*) and the Club Mosses (*Lycopodiums*) and are included with the Phanerogams or flowering plants in Baker's "North Yorkshire."

The artificial system of classification adopted by Linneus was in some measure applied to Mosses by early Continental authors; thus Hedwig's works (1782 to 1801) and Bridel's works (1798 to 1826). The chief character by which the mosses were arranged into genera was by the number and arrangement of teeth or peristome around the mouth of the urn-like capsule. This method was to a great extent followed by Hooker and Taylor in their "**Muscologia Britanica**," (1818, a second edition, 1827) which was a

book that brought the British mosses to the notice of students in this country.

Sir W. J. Hooker was born at Norwich, 1785, was Regius Professor of Botany at Glasgow, 1820, and afterwards Director of the Royal Gardens, Kew, to 1865. Hooker was a very good artist, and made beautiful drawings of mosses which are of great service in discriminating these minute plants. The drawings in Hooker's "**Musci Exotici**,"—2 vols. published in 1818 and 1820—are excellent and the work is of great help in the study of tropical and other exotic mosses, and is often referred to by writers on them.

"**Muscologiæ Hibernicæ Spicilegium**," by Dawson Turner, A.M. published at Yarmouth, 1804, contains a list of Irish mosses and has 16 plates with good figures of several, and is often quoted from.

Smith and Sowerby's "**English Botany**" was begun in 1790 and extended to March, 1814. In this were enumerated 348 mosses and 80 Hepaticæ. Supplement in 1831, 1834, 1843, and 1849, and part of a 5th volume 1865. Yorkshire contributors to "**English Botany**" were James Backhouse, York; W. Brunton, Ripon; Rev. J. Dalton, Croft, Yorkshire; Rev. J. Harriman, Croft, Yorkshire, (*discovered *Gentiana verna* in Teesdale*); Edward Robson, Darlington; Jonathan Salt, Sheffield; Richard Spruce, Welburn, Castle Howard. (*See Biographical Index of British and Irish Botanists by James Britten and G. S. Boulger, 1893*).

The fifth volume of Sir J. E. Smith's "**English Flora**," containing the descriptions of the Mosses and Hepaticæ edited and partly written by Hooker was issued in 1844.

In 1836 was commenced on the Continent the great work on European mosses, **The Bryologia Europœa**, by Bruch, Gumbel, and Schimper, which was not completed until 1855. In this work a more natural arrangement of these plants was attempted. The improvements made by the

opticians in the microscope helped the workers to dissect the plants and get a better knowledge of their structures. The minute floral organs were made known and shown to have important characters, and the cell structure of stem, leaves, &c., were also carefully investigated, and thus the structural characters of the entire plant assisted much in grouping these minute plants into a natural arrangement.

In 1855, "**The Bryologia Britannica**" was issued by **W. Wilson**, of Warrington, in which a good many additional mosses were made to the British Flora. Mr. Wilson had for long been a correspondent of Schimper, and in his book called attention to the "**Bryologia Europæa**," and introduced into his work much of the arrangement of the classification of that work. The book under the above title was issued as a third edition of *Hooker and Taylor's "Muscologia Britannica."* In it are described about 450 mosses then known in Britain.

Berkeley's "Handbook of British Mosses" was published in 1863, and followed the classification of the *Bryologia Britannica*. Some 75 additional species are added in this work.

A useful synopsis of British Mosses was issued by **Charles P. Hobkirk of Huddersfield** in 1873, and a second edition in 1884. In this was enumerated a total of 576 mosses then known in Britain, and it was a useful book to students.

During the time that the classical work, the "*Bryologia Europæa*" was issuing, 1836 to 1855, the authors had several British correspondents, many of whom would render aid in discriminating the British mosses, the localities of which are given in that work.

The most eminent of these for Yorkshire was certainly my early master, **Richard Spruce**, who then resided at Welburn, near Castle Howard, and I had the good fortune to become one of his pupils. From him I got to know how to use a microscope, and thus got my first knowledge of the beauties of the mosses, and I can truly say their examination and

study has been a source of great pleasure to me through life, as well as giving me a great relief at times from the laborious work of a business life.

Spruce commenced studying the mosses about 1841, and his early work was investigating the Castle Howard district, also the neighbourhood of York, examining the banks of the Ouse and Foss, up Wharfedale to the Strid and Bolton Woods, as well as visiting Stockton Forest, Strensall Common, and other uncultivated heathery ground, in which district he made many interesting discoveries, both of Mosses and Hepatics, most of which are recorded in the first edition of "North Yorkshire." (See *Phytologist*, Vol. 1. pp. 101-189 and 198).

Dec. 1842, Spruce made an excursion to Eskdale, and investigated Goathland, by the Beck, the neighbourhood of Egton and Newtondale, and discovered the rare Hepatic "*Liochlaena lanceolata*" its first discovery in the British Isles. (See *Phytologist*, Vol. 3, pp. 540 to 544).

In 1843 Spruce visited Teesdale, located himself at the High Force Inn for some three weeks, and was the first Bryologist to investigate the fine district of Upper Teesdale. The result of this excursion was a paper written by him— "**The Musci and Hepaticæ of Teesdale,**" by **Richard Spruce**, read Jan. 11, 1844, at the meeting of the Botanical Society of Edinburgh, of which Spruce was a fellow. This paper contains a list of 167 Mosses and 41 Hepaticæ, with excellent descriptions of many for the first time discovered in Yorkshire. His critical descriptions of the novelties are very good, and the paper was a great addition to the Bryology of Yorksire, and is still often referred to for its excellent descriptions.

In 1845 appeared a paper on "**Several Mosses New to the British Flora,**" by **Richard Spruce**. This was published in Sir W. J. Hooker's "London Journal of Botany." In this, 23 mosses are named and most carefully described,

all of which are new to Britain, and 20 of them were mosses found in North Yorkshire by Spruce.

A more recent work, "The Students Handbook of British Mosses," by H. N. Dixon, M.A.F.L.S., with illustrations and keys to the genera and species, by H. C. Jameson, M.A., was issued in 1896. A second edition was published in 1904.

The nomenclature in this book follows mostly that adopted in Wilson's "*Bryologia Britannica*." In the second edition there is revision of some of the genera such as *Sphagnum*, *Weissia*, *Pottia*, and the Harpidioid Hypna.

The more natural arrangement adopted by Braithwaite is not used, although many of Braithwaite's new generic names are given as synonyms.

The book is a handy working book.

Robert Teesdale, who was some time principal gardener at Castle Howard, drew up his "*Plantæ Eboracenses*," which was printed in the first volume of the "Linnean Transactions." This was a list of the native plants growing chiefly around Castle Howard. A supplement to this was printed in the second volume of these Transactions (1798) which contained a copious list of flowering plants, as well as a list of 71 Urn Mosses and 23 Hepaticæ for the whole county. Both lists are carefully drawn up, and are still referred to by writers on Botanical Geography, and the list of mosses is one of the earliest for Yorkshire.

A supplement of Baines' "Flora of Yorkshire" was published in 1854, the first part, giving a list of the flowering plants and ferns, by John Gilbert Baker. The second part contained the mosses of the county, by John Nowell, of Todmorden. This enumerates 329 Urn Mosses then known in the county. The contributors to the list were R. Spruce, W. Mudd, W. Brunton, J. G. Baker, Dr. J. B. Wood, J. H. Davies, S. Gibson, Rev. J. Dalton, S. Hailstone, H. Ibbotson.

The first edition of "*North Yorkshire*," by John Gilbert Baker, was published in 1863. It contained a very full list

of the flowering plants, and also the names and their localities of 309 Mosses, which had then been discovered as growing in this division of the county. It is a very representative list, and contains excellent notes on their distribution in the various zones of elevation, and gives the names of the contributors.

The Scale Mosses or *Hepaticæ*, however, are not included in this work, as at that period very few botanists had taken up this group.

The true principles of classification, however much they have been amplified and refined upon, were in reality expressed by **Ray**, when he defined “*a natural system to be that which neither brings together dissimilar species nor separates those which are nearly allied.*”

One of the best modern works on the British Urn Mosses is “**The British Moss Flora**,” by Dr. R. Braithwaite, F.L.S., &c., of London, who is a native of Yorkshire, his birthplace being Whitby. These humble plants are arranged, so far as present knowledge of them, in a natural arrangement. All parts and organs of the plants are taken into account more or less, and thus a more comprehensive knowledge of their structure is gained by this method, than by arranging them in the artificial system of fixing upon the variations in one particular organ. Nevertheless, in all arrangements up to the present time, some plan has to be adopted which may be said to be in a great measure artificial.

The two main divisions into which the Urn Mosses are first divided—*viz.*, the Acrocarpous and Pleurocarpous—must be so considered.

In dealing, however, with an insular flora like that of the British Islands, some amount of artificial arrangement becomes necessary. The mosses may be really put into two great groups as regards their distribution over the Globe—the Tropical and Arctic. In the British Islands the mosses, in a great measure, belong to the Arctic group, but some

few of the tropical mosses are to be met with in sheltered nooks of our Islands—outliers as they may be called—and are probably remnants of a tropical flora in the earlier geological periods of our Islands, and these are added to their nearest allies, in the best way, by the author; and a compendium of this arrangement is given.

There is, however, no finality in any natural arrangement of plants, and we can only hope that students of the future may keep improving the method of classifying these plants by additional and more accurate observations which future optical improvements may afford.

Dr. Braithwaite's arrangement in "The British Moss Flora" is as follows:—

MUSCI ACROCARPI.

SECT. 1.—SCHISTOCARPI.

Fam. 1. ANDREÆACEÆ.

Genus 1. *Andreæa* Ehrhart. 4 species and some varieties.

SECT. 2.—STEGOCARPI.

Fam. 2. BUXBAUMIACEÆ.

Genus 1. *Buxbaumia* Haller. 2 species only known of this in Britain.

Fam. 3. GEORGIACEÆ.

Genus 1. *Georgia* Ehrhart. 2 species.

Fam. 4. POLYTRICHACEÆ.

Genus 1. *Catharinea* Ehrhart. 3 species.

„ 2. *Oligotrichum* Lam. De C. 1 species.

„ 3. *Polytrichum* Dill. 11 species and varieties.

Fam. 5. FISSIDENTACEÆ.

Genus 1. *Fissidens* Hedwig. 17 species and var.

Fam. 6. LEUCOBRYACEÆ.

Genus 1. *Leucobryum* Hampe. 1 species.

Fam. 7. DICRANACEÆ.

Genus 1. *Archidium* Bridel. 1 species.

- Genus 2. **Pleuridium** *Brid.* 3 species.
 „ 3. **Ditrichum** *Timm.* 5 species and var.
 „ 4. **Swartzia** *Ehrhart.* 2 species.
 „ 5. **Dicranella** *Schimp.* 5 species and varieties.
 „ 6. **Anisothecium** *Mitt.* 5 species and var.
 „ 7. **Seligeria** *Br. Schimp.* 7 species and var.
 „ 8. **Brachydontium** *Bruch.* 1 species.
 „ 9. **Blindia** *Br. Schimp.* 3 species.
 „ 10. **Didymodon** (*Hedw.*) *Web. Mohr.* 1 species.
 „ 11. **Campylopus** *Brid.* 12 species.
 „ 12. **Dicranoweissia** *Lindb.* 2 species.
 „ 13. **Dicranum** (*Dicks.*) *Sm.* 21 species.
 „ 14. **Dichodontium** *Schimp.* 2 species.
 „ 15. **Oncophorus** *Brid.* 8 species.
 „ 16. **Ceratodon** *Brid.* 2 species.
 „ 17. **Sælania** *Lindb.* 1 species.

Fam. 8. TORTULACEÆ.

- Genus 1. **Ephemerum** *Hampe.* 6 species.
 „ 2. **Acaulon** *C. Muell.* 2 species.
 „ 3. **Phascum** (*L.*) *Schreb.* 3 species and var.
 „ 4. **Pottia** *Ehrh.* 14 species and varieties.
 „ 5. **Tortula** *Hedw.* 21 species and varieties.
 „ 6. **Pleurochaete** *Lindb.* 1 species.
 „ 7. **Mollia** *Schrank.* 25 species and varieties.
 „ 8. **Leptodontium** *Hampe.* 3 species.
 „ 9. **Barbula** *Hedw.* 17 species and varieties.
 „ 10. **Cinclidotus** *Arnott.* 2 species.
 „ 11. **Leersia** *Hedw.* 5 species.

Fam. 9. WEBERACEÆ.

- Genus 1. **Webera** *Ehrhart.* 1 species.

Fam. 10. GRIMMIACEÆ.

- Genus 1. **Grimmia** *Ehrhart.* 38 species and varieties.
 „ 2. **Coscinodon** *Spreng.* 1 species.
 „ 3. **Glyphomitrium** *Brid.* 3 species.
 „ 4. **Anæctangium** *Hedw.* 2 species.

- Genus 5. **Pleurozygodon** *Lindb.* 1 species and var.
 „ 6. **Zygodon** *Hook Tayl.* 5 species.
 „ 7. **Orthotrichum** *Hedw.* 17 species and var.
 „ 8. **Weissia** *Ehrh.* 7 species and varieties.
- Fam. 11. SCHISTOSTEGACEÆ.
- Genus 1. **Schistostega** *Mohr.* 1 species.
- Fam. 12. SPLACHNACEÆ.
- Genus 1. **Splachnum** *L.* 3 species.
 „ 2. **Tetraplodon** *Br. Sch.* 3 species.
 „ 3. **Tayloria** *Hook.* 2 species.
- Fam. 13. OEDIPODIACEÆ.
- Genus 1. **Ædipodium** *Schwæg.* 1 species.
- Fam. 14. FUNARIACEÆ.
- Genus 1. **Discelium** (*Dicks.*) *Brid.* 1 species.
 „ 2. **Amblyodon** (*Dicks.*) *P. Beauv.* 1 species.
 „ 3. **Nanomitrium** (*Bruch*) *Lindb.* 1 species.
 „ 4. **Physcomitrella** *Br. Schp.* 1 species.
 „ 5. **Physcomitrium** (*Ludw.*) *Brid.* 2 species.
 „ 6. **Funaria** *Schreb.* 6 species.
- Fam. 15. BRYACEÆ.
- Genus 1. **Oreas** *Brid.* 1 species.
 „ 2. **Stableria** *Lindb.* 1 species.
 „ 3. **Leptobryum** *Wilson.* 1 species.
 „ 4. **Pohlia** *Hedw.* 12 species and varieties.
 „ 5. **Eipterygium** (*Grev.*) *Lindb.* 1 species.
 „ 6. **Plagiobryum** *Lindb.* 2 species.
 „ 7. **Bryum** *Dill.* 38 species and varieties.
- Fam. 16. BARTRAMIACEÆ.
- Genus 1. **Conostomum** *Swartz.* 1 species.
 „ 2. **Bartramia** *Hedw.* 5 species and varieties.
 „ 3. **Philonotis** *Brid.* 7 species and varieties.
 „ 4. **Breutelia** *Schimp.* 1 species.
 „ 5. **Catoscopium** (*Hedw.*) *Brid.* 1 species.
- Fam. 17. MEESEACEÆ.
- Genus 1. **Meesea** (*L.*) *Spruce.* 1 species.

- Genus 2. *Paludella* (L.) *Brid.* 1 species.
 Fam. 18. MNIACEÆ.
 Genus 1. *Gymnocybe* *Fries.* 2 species and var.
 „ 2. *Orthopyxis* *P. Beauv.* 1 species.
 „ 3. *Timmia* *Hedw.* 2 species.
 „ 4. *Mnium* *Dill. L.* 14 species and var.
 „ 5. *Cinclidium* *Swartz.* 1 species.

MUSCI PLEUROCARPI.

- Fam. 19. HYPNACEÆ.
 Genus 1. *Thuidium* *Br. Schp.* 6 species.
 „ 2. *Leskea* *Hedw.* 3 species and varieties.
 „ 3. *Anomodon* *Hook. Tayl.* 3 species.
 „ 4. *Amblystegium* *Br. Schp.* This genus is subdivided into 6 sections, with a total of 42 species.
 Sect. 1. *Euamblystegium* *Lindb.* 1 to 13 species.
 Sect. 2. *Campyliadelphus* *Lindb.* 14 to 18 species.
 Sect. 3. *Drepanocladus* *C. Muell.* 1856. 19 to 30 species and var.
 Sect. 4. *Scorpidium* *Schimp.* 1 species.
 Sect. 5. *Hygrohypnum* *Lindb.* 32 to 37 species and var.
 Sect. 6. *Calliargon* *Sulliv.* 38 to 42 species and var.
 Genus 5. *Hypnum* *Dill. L.*, with 7 sections, and a total of 43 species.
 Sect. 1. *Myurium* *Schimp.* 1 species.
 Sect. 2. *Scleropodium* *Br. Schp.* 2 to 4 species.
 Sect. 3. *Panckowia* *Neck.* 5 to 16 species and varieties.
 Sect. 4. *Rhynchostegiella* *Schimp.* 17 to 20 species.
 Sect. 5. *Rhynchostegium* *Schimp.* 21 to 27 species and var.
 Sect. 6. *Brachythecium* *Schimp.* 28 to 40 species and var.
 Sect. 7. *Pleuropus* (Griff.) *Mitt.* 41 to 43 species.
 Genus 6. *Lesquereuxia* *Br. Schp.* 4 species.
 „ 7. *Isothecium* *Bridel.* 2 species and varieties.
 „ 8. *Pterogonium* *Swartz.* 1 species.
 „ 9. *Pterygandrum* *Hedw.* 1 species.

- Genus 10. **Helicodontium** *Schwaeg.* 1 species.
 „ 11. **Habrodon** *Schimp.* 1 species.
 „ 12. **Myurella** *Br. Schimp.* 2 species.
 „ 13. **Heterocladium** *Br. Schimp.* 2 species and var.
 Genus 14. **Hylocomium** (*Ehrh.*) *Br. Schimp.* 9 species
 and var.
 Genus 15. **Campyllum** (*Sull.*) *Mitt.* 2 species and var.
 „ 16. **Ctenidium** (*Schimp.*) *Mitt.* 2 species and var.
 „ 17. **Hyocomium** *Schimp.* 1 species.
 „ 18. **Ptilium** (*Sulliv.*) *De Not.* 1 species.
 „ 19. **Sematophyllum** *Mitt.* 2 species.
 „ 20. **Stereodon** (*Brid.*) *Mitt.* 14 species and var.
 „ 21. **Isopterygium** *Mitt.* 6 species and varieties.
 „ 22. **Plagiothecium** *Schimp.* 6 species and var.
 „ 23. **Acrocladium** *Mitt.* 1 species and varieties.
 „ 24. **Entodon** (*La Pyl.*) *Lindb.* 1 species.
 Fam. 20. NECKERACEÆ.
 Genus 1. **Porotrichum** (*Brid.*) *Mitt.* 2 species.
 „ 2. **Homalia** *Brid.* 1 species.
 „ 3. **Neckera** *Hedw.* 4 species and varieties.
 „ 4. **Alsia** *Sulliv.* 1 species.
 „ 5. **Climacium** *Web. Mohr.* 1 species.
 „ 6. **Fontinalis** (*Dill.*) *L.* 7 species and varieties.
 „ 7. **Antitrichia** *Brid.* 1 species and variety.
 „ 8. **Leucodon** *Schwaeg.* 1 species.
 „ 9. **Cryphæa** *Web. Mohr.* 2 species.
 „ 10. **Hedwigia** *Ehrh.* 2 species and varieties.

A Supplement with additions of 36 mosses of recent discovery in the British Islands.

The following pages contain the names and localities of all mosses known up to the present time in North Yorkshire, which I have been able to record by the help of several kind friends, who have investigated various districts, and sent me specimens, to all of whom I tender my best thanks.

ACROCARPOUS MOSSES.

FAM. I. ANDREÆACEÆ.

Andreæa. Ehrhart.

An alpine genus, entirely confined to the basaltic and hard rocks, on the highest ridges of the hills. Rarely met with at a less elevation than about 800 feet above sea level.

1. **A. petrophila.** Ehrht. (*A. rupestris*, Hedw.).

Montane B. Range 2-3.

Frequent on exposed rocks in Upper Teesdale, from a little below the High Force to the highest ridges (Spruce. 1843).

Upon the gritstone edges over Lunedale Tarns, Nine Standards, Ravens' Seat Moor and Lovely Seat (Baker).

On the hills east of the vale of York, above Highcliff, Guisbro' Moor (Barnes. 1887).

Fruiting 6-8 mths.

Several varieties of this moss are given in Dr. Braithwaites' British Moss-flora, which have been found upon the highest peaks of the Scotch mountains. None of these have been met with on the less elevated Yorkshire Hills.

2. **A. alpina** (Dill). Smith.

Montane A. Range 2-3.

Hard rocks on Cronkley Fell, Teesdale (Spruce. 1843).

In tolerable plenty upon most of the higher scars in Upper Teesdale (Baker).

Kisdon Scars, near the Force, Upper Swaledale (R. Barnes).

Fruiting 6-7 mths.

Hitherto not found on the highest ridges of the hills, on the east of the York vale.

3. *A. crassinervis*. Bruch.

Montane A. Range 2-3.

(High rocks above Falcon Clints, near to Caldron Snout, Upper Teesdale). (Slater and Anderson 1853).

Fruiting 7-8 mths.

The locality given for this moss is on the north side of the river Tees, consequently in the county of Durham. The rich botanical portion of Upper Teesdale, from the High Force to Caldron Snout, would generally be investigated on both sides of the river by any botanists exploring the district, and most of the rare plants are found on both sides of the river, so I ventured to include the rare mosses found in this small tract of the adjoining county, putting in brackets the few which have hitherto not been recorded from the Yorkshire side of the river.

4. *A. Rothii*. Web. and Mohr.

Montane B. Range 2-3.

In Upper Teesdale at Cronkley Fell on limestone rocks, and at Falcon Clints on Basalt (Spruce.).

Plentiful in Upper Teesdale and Lunedale. Upon the Coverdale Slope of Great Whernside. Amongst the Eastern hills, on the freestone crags of Lonsdale, Baysdale, and Ingleby Moor (Baker).

Var. *falcata*. (Schp.). Lindb.

On high basaltic rocks near Caldron Snout, Upper Teesdale, growing with the normal form (M.B.S.).

Fruiting 6-7 mths.

FAM. 2. BUXBAUMIACEÆ.

(*Buxbaumia*, Haller.

Two species only are known in Britain of this rare genus of mosses, neither of which have hitherto been met with in North Yorkshire.)

(Buxbaumia aphylla, L.

There is a record of this from heathy ground on Sawley Moor near Ripon (T. Simpson), given in J. Nowells' list of Yorkshire Mosses in the Supplement of Baines' "Flora of Yorkshire," 1854. The locality is in West Yorkshire.)

This genus of mosses is found growing on decaying trunks of *Pinus sylvestris* or other Firs, and it should be looked for amongst the hills of North Yorkshire where it is probable it may be met with (M.B.S.).

FAM. 3. GEORGIACEÆ.

Georgia, Ehrh. (Tetraphis, Hedw.).1. **G. pellucida. (L.) Rabenh.**

Montane B. Range 1-2.

Frequent upon shaded rocks, amongst the hills, on both sides of the central valley (Baker).

On decayed stumps of trees and on turfy banks on heaths in the central vale, where it rarely fruits. It produces shoots with a terminal rosette of gemmiparous buds, by which it increases.

On rocks in Saltersgate Beck, fruiting (Anderson).

Arncliffe wood, Eskdale, and Blueberry gill, Goathland, fruiting abundantly (M.B.S.).

On decaying stumps near Guisbro'; also near Hawnby, Bilsdale; fruiting (Barnes).

Strensall Common, and near Helmsley (Ingham).

Fruiting 6-7 mths.

2. **G. Brownii (Dicks.) C. Muell.**

(*Tetradontium Brownianum*. Schwgr.)

Montane B. Range 1-2.

Not uncommon upon shaded sandstone rocks, amongst both ranges of hills (Baker).

On the underside of stones in Upper Teesdale (Spruce.).

On rocks in Rigmill Wood, near Whitby (Anderson).

Near Mallyan Spout, Goathland (M.B.S.).

Rocks at Battersby, Cleveland (W. Mudd).

Irelet gill, Gunnerside, Upper Swaledale, also at Saltburn and Kilton in Cleveland (R. Barnes).

High Cliff, near Guisbro' (Baker).

Fruiting 7 mth.

FAM. 4. POLYTRICHACEÆ.

Catharinea, Ehrh. (**Atrichum**, P. Beauv.).

1. **C. Undulata** (L.) Web. & Mohr.

(*Atrichum undulatum*. P. Beauv.).

District C. Range 1-2.

On clay and sandy soil in woods, by the side of paths, and on hedgebanks in damp localities. Common in the low country also amongst the hills (Baker).

Fruiting 11-12 mths.

Var. **tenelliforme**. Schpr. M.S.S.

Sandy ditch by the side of the Railway on Strensall Moor (Spruce. 1847).

Got in the same locality (Wheldon. 1889).

Var. **minor** Hedw.

On bare ground Holwick Fell, Upper Teesdale (R. Barnes).

Oligotrichum. Lam. De C.

1. **O. incurvum**. (Huds.) Lindb.

(*O. hercynicum* De C.).

Montane A. Range 2-3.

On the peak of Great Whernside, and also on the Coverdale slopes of the hill at an elevation of about 1500 ft. (Baker).

Fruiting 7 mth.

Polytrichum, Dillen.1. **P. subrotundum**, Huds.*(Pogonatum nanum. P. Beauv.)*.

C. Range 1-2.

On sandy places on heaths and banks in woods, especially amongst the hills; not common. In Teesdale; on Stockton forest, and Scalby Moor near Scarbro' (Spruce.).

Near Helmsley (J. A. Wheldon).

Fruiting 11-2 mths.

2. **P. aloides**. Hedw.*(Pogonatum aloides. P. Beauv.)*.

C. Range 1-2.

Heaths, hollow banks, and by the sides of paths in woods, common.

Fruiting 11-12 mths.

Var. **B. Dicksoni**. (Turn.) Wallm.

Lockwood Beck Reservoir (R. Barnes).

3. **P. urnigerum**. L.*(Pogonatum urnigerum P. Beauv.)*.

C. Range 1-3.

On banks and by streams in sub-alpine districts, not uncommon. Teesdale, and Castle Howard Park Quarry (Spruce.).

Strensall Common (Ingham).

Fruiting 11-1 mths.

4. **P. alpinum**. L.*(Pogonatum alpinum. Rohl.)*.

Montane B. Range 1-3.

Rough stony and grassy places on the hills, descending to the lower moorlands in a dwarf form. Recorded from the east side of Raywood, Castle Howard (Teesdale 1798).

In numerous localities amongst the western moors, ascending to the peaks of Mickle Fell, Great Whernside, and Lovely Seat (Baker).

Abundant in heathy situations in Upper Teedale (Spruce).

On the east on Ayton Moor and near the head of Flazendale (Baker).

Near Saltergate (M.B.S.).

High Cliff, Guisbro' (R. Barnes).

Fruiting 7-8 mths.

5. *P. attenatum*, Menz.

(*P. formosum*, Hedw.).

C. Range 1-2.

Dry woods on heathy ground, common. Very abundant in some of the Castle Howard woods, on a peaty soil, where it sometimes occupies large tracts almost to the exclusion of every other herb (Spruce).

Moory ground above Boltby near Thirsk (Baker).

Cliff rig, Ayton, Cleveland (Mudd.). Cockmill Wood, near Whitby (R.B.).

Helmsley, Strensall and Hackness (Ingham).

Fruiting 6-7 mths.

6. *P. gracile*. Dicks.

Montane B. Range 1-2.

Heaths on turfy soil, sides of peat cuttings, not common.

Near Cronkley, Upper Teedale and Terrington Carr, Castle Howard (Spruce.).

Myton Moor Cleveland (W. Mudd.).

Abundant in Fen Bog by the side of Whitby Railway at the upper part of Newton Dale (Baker).

Leckby Carr (Barnes).

Fruiting 7 mth.

7. *P. piliferum*, Schreb.

C. Range 1-2.

On dry heaths very common. Upper Teesdale, and at Ganthorpe, Castle Howard (Spruce.).

Ascending to the plateau of Pin Seat (Baker).

Abundant on dry heathy ground amongst the eastern hills (M.B.S.).

Fruiting 5-6 mths.

8. *P. juniperinum*, Willd.

C. Range 1-3.

Wet heaths and bare places in woods, common. Ascending from the central valley to the upper zone peaks (Baker).

Cronkley, Teesdale, Terrington Carr, Castle Howard and Stockton Forest (Spruce.).

Strensall Common, Kirkham and Kilburn (Ingham).

Fruiting 6-7 mths.

9. *P. strictum*, Banks.(*P. alpestre* Hoppe.).

C. Range 1-3.

Boggy heaths. Not uncommon amongst the hills, but less frequent than the previous one.

Terrington Carr, Castle Howard (M.B.S.).

Pilmoor (Ingham).

Fruiting 5-6 mths.

10. *P. commune* L.

C. Range 1-3.

Marshy places on turf moors, common.

Ascending from the central valley to the upper zone peaks (Baker).

Var. **fastigiatum** (Lyle.). Wils.

On the moor near the road side on the slope of Easter side, towards Bilsdale (Baker).

Var. **minus** Weiss.

Strensall Common (Ingham).

Fruiting 6-7 mths.

FAM. 5. FISSIDENTACEÆ.

Fissidens, Hedw.1. **F. exilis**, Hedw. (*F. Bloxami*, Wils.).

C. Range 1-2.

Shaded banks by ditches, and in woods, rare or overlooked, very minute.

Kirkham Hill (Spruce. 1847).

Airyholme Wood, near Ayton (Mudd.).

Near Richmond, and in Cleveland near Easington, Kilton and Saltburn (Barnes).

In Newton Dale near Levisham growing with *F. bryoides* (M.B.S.).

Fruiting 1-2 mths.

2. **F. minutulus**, Sullivant.

(*F. pusillus* var. *madidus*, Spruce.).

C. Range 1-2.

On sandstone rock, and dripping stones in damp shaded places, amongst both ranges of hills, not uncommon. Castle Howard and Mowthorpe Dale (Spruce.).

Near Richmond and Hudswell on the Swale (Barnes).

Near Gormire and Hawnby, also by the tributary streams of the Esk near Whitby (M.B.S.).

Fruiting 8-11 mths.

3. *F. exiguus*. Sull.*(F. viridulus var. Lylei Wils.)*.

C. Range 1.

Stones in damp shady places, rare.

Shady clay banks at Saltburn (R. Barnes. 1889).

Fruiting 9-2 mths.

4. *F. incurvus*. Starke.

C. Range 1.

Clay banks and damp pastures, not common.

Clifton near York, and Welburn near Castle Howard
(Spruce.).

Great Ayton (Mudd.).

On clay banks at Sutton under Whitstoncliff (Baker).

Arncliffe Wood, Eskdale (M.B.S.).

Near Richmond, Easington and Saltburn (Barnes).

Near Scarbro' (Wheldon. 1888).

On cliff at Cayton Bay (Webster, 1905).

Fruiting 2-4 mths.

Var. *tamarindifolius*. Don.

Clay pastures near Saltburn (Barnes. 1889).

5. *F. viridulus*. (Swartz.) Wahl.

C. Range 1-2.

On clay banks and damp sandstone rock, not common.

Beckhole near Whitby (Braithwaite. 1858).

Shaded banks near Saltburn (Barnes).

Fruiting 10-2 mths.

6. *F. fontanus* Schpr.*(F. crassipes. Wils.)*.

C. Range 1-2.

On woodwork and stones in sluices and wet places, not
common.

Crambeck, Castle Howard (Spruce. 1844).

On stones in Codbeck at Kilvington near Thirsk (Baker).

Near High Force, Teesdale, and Liverton beck, Cleveland (Barnes).

Mill Sluice by Bedale Beck (Wheldon).

Fruiting 9-10 mths.

7. *F. bryoides*. (L.) Hedw.

C. Range 1-2.

Common on damp shady banks in woods, and by stream sides, frequent in the low country and amongst the hills.

Fruiting 10-1 mths.

8. *F. osmundoides*. (Swartz.) Hedw.

Montane B. Range 1-2.

In wet grassy places, on heaths, &c., not very common. On most of the Teesdale Scars, from the falls of Maze beck, eastward to the High Force. In the west Swale district on Kisdon Scars, and damp rocks in Whitstondale (Baker).

On the east on wet rocks on Guisbro' Moor (Mudd.).

Beckhole, Eskdale (Baker).

Arncliffe Wood, Eskdale (M.B.S.).

Fruiting 7 mth.

9. *F. cristatus*. Wils.

(*F. decipiens* De Not.)

Montane B. Range 1-2.

Wet rocks near the sea, and on the ground in hilly districts, not common.

Rainton Heights, Hambleton hills (Baker).

Near High Force, Teesdale; at Aysgarth Force; and on wet rocks near Easington, Cleveland, Kisdon Force, Swaledale. In Wensleydale and near Hawnby in Bilsdale (Barnes).

Near Kilburn (Ingham).

A tall form with distant, narrow slightly crisped leaves, was found on grassy hillocks in shade at Coneysthorpe by Dr. Spruce.

Fruiting 12-3 mths.

10. *F. taxifolius*. (L.) Hedw.

C. Range 1-2.

On clay banks in woods, damp fields and by road sides in damp places. Common both in the low country and amongst the hills.

Fruiting 10-12 mths.

11. *F. adiantoides*. (L.) Hedw.

Montane B. Range 1-3.

Shady wet banks and heaths, and on dripping sub-alpine rocks, not uncommon. Slingsby Moor, Castle Howard (Spruce. 1838).

Frequent in swamps and upon damp rocks ascending from Pilmoor and Stockton forest, to the limestone pavement of Cam Fell and Widdale Fell, and on the cliffs of the western face of Mickle Fell (Baker).

Saltersgate Beck (Anderson).

Troutsdale (M.B.S.).

Near Hawnby, Bilsdale, and Cotcliffe near Northallerton (Wheldon).

Fruiting 12 mth.

FAM. 6. LEUCOBRYACEÆ.

Leucobryum Hampe.

L. glaucum. (L.) Schmpr.

C. Range 1-3.

Wet heaths and woods common. Ascending from the Central Valley to the upper zone peaks.

Very rarely fruiting.

On Stockton Forest gathered in fine fruit by Spruce.
Oct. 1847.

Fruiting 10-3 mths. rarely.

FAM. 7. DICRANACEÆ.

Archidium Bridel. (*Phascum*, Dicks.).

A. alternifolium. (Dicks.). Schmpr.

(*A. phascoides* Brid.).

C. Range 1-2.

Wet fields and heaths, not uncommon. In the Central Valley in damp sandy ground on Pilmoor (Baker).

Stockton Forest (Spruce.).

Gilla Leys, Castle Howard (M.B.S.).

By the Tees below Falcon Clints, Blea Beck and on the east in clayey pastures, near Saltburn (Barnes).

Fruiting 3-5 mths.

Pleuridium Brid. (*Phascum* Hedw.).

1. **P. axillare** (Dicks.). Lindb.

(*Phascum nitidum*, Hedw.).

C. Range 1.

Wet clay fields and banks, and by dried up pools, not very common. Near York (Spruce. 1841).

Aislabeck near Richmond (Ward).

On banks at Great Ayton, Cleveland (Mudd.).

On Scarborough Racecourse (G. Webster).

Near Lingdale, Roxby, Guisbro' and Saltburn in Cleveland, also at Billybank wood, Richmond (Barnes).

Var. **strictum.** Braithwaite.

Near Terrington, Castle Howard (W. Ingham. 1898).

Fruiting 10-2 mths.

2. **P. subulatum.** (Huds.). Rabenh.*(Phascum subulatum* Hedw.).

C. Range 1-2.

Sandy banks, heaths and sides of paths, common in low country and amongst the hills.

Ganthorpe, Castle Howard (Spruce. 1841).

Troutsdale (M.B.S.).

Near York (Wheldon).

Fruiting 3-4 mths.

3. **P. alternifolium.** (Kaulf.). Rabenh.*(Phascum alternifolium.* Bruch.).

B. Range 1-2.

Fallow fields and wet heaths, not uncommon.

Near High Force, Teesdale, and in the Howardian tract at Welburn and Kirkham Hill (Spruce. 1844).

In the Central Vale frequent about York (Baker).

Wet clay ground near Saltburn (Barnes).

Fruiting 5-6 mths.

Ditrichum, Timm. (*Trichostomum,* Hedw.).1. **D. tenuifolium.** (Schrad.). Lindb.*(Ceratodon cylindricus,* B. et S.).

C. Range 1.

Fallow fields and wet sandy ground very rare. In the central vale on Stockton Forest near York, and on old charcoal stools in the Castle Howard Woods (Spruce.).

Fruiting 5-6 mths.

2. **D. tortile** (Schrad.). Hampe.*(Trichostomum tortile,* Schrad.).

C. Range 1-2.

Sandy banks and old sandstone quarries, very rare.

In the sandstone quarry Castle Howard Park (Spruce. 1844).

Sea shore at Whitby (Ibbotson).

Fruiting 10-12 mths.

Var. **B. pusillum** (Hedw.).

In the quarry at Castle Howard Park, growing intermixed with the normal form (Spruce.).

3. **D. homomallum** (Hedw.). Hampe.

(*Trichostomum homomallum* B. et S.).

B. Range 1-2.

Broken sandy ground and banks in sub-alpine districts, not rare. Sandstone quarry and in some of the Castle Howard Woods (Spruce.).

Near Caldron Snout, Upper Teesdale (M.B.S.).

High Cliff, Guisbro' (Barnes).

Fruiting 9-11 mths.

5. **D. flexicaule**. (Schleich.). Hampe.

(*Trichostomum flexicaule*, B. et S.).

Montane B. Range 1-3.

Limestone rocks and stony ground, not uncommon. This species *Mollia* (*Tortula*) *tortuosa*, and *Neckera crispata*, are amongst mosses, what *Scabiosa columbaria*, *Poterium sanguisorba*, and *Carlina vulgaris* are amongst the flowering plants, species distributed through the dysgeogenous tracts, and often growing there plentifully, but otherwise rare. These three mosses furnish typical illustrations of what I have called the Xerophilous role of distribution (Baker).

Common upon dry banks amongst the calcareous hills upon both sides of the Central Valley. It grows on the magnesian limestone in various places and ascends on the

west to the main limestone of Mickle Fell, and the limestone pavement of Camfell and Widdale Fell, and on the east to the plateau of Hambleton end. Summit of Cold Moor at the head of Bilsdale (Baker).

Growing on the basaltic rock in Upper Teesdale (Spruce.).

Near Saltersgate and in Troutsdale (M.B.S.).

On Huntcliff, near Saltburn (Barnes).

Fruiting 6 mth. very rarely.

(Var. **B. densum** B. et S.

(On Widdy Bank Fell, Upper Teesdale in Durham) (Barnes).

Swartzia Ehrh. (*Distichium* B. et S.).

1. **S. montana** (Lamk.). Lindb.

(*Distichium capillaceum* B. et S.).

Montane B. Range 1-3.

Wet crevices of rocks amongst the hills. Frequent on moist basaltic rocks near Winch Bridge, Upper Teesdale (Spruce. 1843).

Descending with the Tees as far as Wycliff and Gainford (Barnes).

Ascending from the river side at Egglestone Abbey to the main limestone of Mickle Fell.

In Swaledale at Kisdon Force, and in Wensleydale at Aysgarth Force, and on the main limestone of Ten end (Baker).

On the east at Ayton Moor (Mudd.).

Kirkby Bank (Dalton, Jun.).

Saltersgate Beck (M.B.S.).

Fruiting 5-7 mths.

2. **S. inclinata.** Ehrh.*(Distichium inclinatum.* B. et S.).

B. Range 1.

Rocks and stony ground in wet places, rare.
Coatham marshes near Redcar (Barnes. 1892).
Fruiting 6-7 mths.

Dicranella. Schpr. (*Dicranum*, Hedw.).1. **D. crispa.** (Ehrh.) Schpr.

C. Range 1-2.

Wet sandy ground, rare. Sandstone quarry in Castle
Howard Park (Stabler and Slater. 1886).
Near Guisbro' and Roxby in Cleveland (Barnes).
Fruiting 8-9 mths.

2. **D. secunda.** (Swartz) Lindb.*Dicranum subulatum* Hedw.

B. Range 1-2.

Wet stony ground, rare.
Dunsley lane near Whitby (Anderson. 1876).
Whitstondale beck, Upper Swaledale, also at Hawnby
in Bilsdale, and Guisbro' moor Cleveland (Barnes. 1888).
Fruiting 9 mth.

3. **D. curvata** (Hedw.). Schpr.

C. Range 1.

Similar localities to the previous one, rare or overlooked.
Sandsend near Whitby (Ibbotson).
Fruiting 9 mth.

4. **D. heteromalla** (Dill. L.). Schpr.

B. Range 1-2.

Damp banks, hollow roads and sandstone rocks, very
common especially amongst the hills.
Fruiting 11-3 mths.

5. **D. cerviculata.** (Hedw.). Schpr.

B. Range 1-2.

Wet heathery ground, and sides of ditches.

Frequent both in the low country and amongst the hills.

Fruiting 6-7 mths.

Anisothecium. Mitten. (*Dicranum* Hedw.).1. **A. rubrum.** (Huds.). Lindb.(*Dicranum varium* Hedw.).

B. Range 1-2.

Damp clay fields, banks of ditches, and sometimes on rocks, common. Ascending to the plateau of Pin Seat (Baker).

Near Haxby, York and Kirkham (Spruce.).

Fruiting 10-12 mths.

Var. **b. tenuifolium,** Bruch.

Goathland Beck. Eskdale (Spruce.).

Var. **c. tenellum,** Schpr.

Dunsley Lane near Whitby (Anderson).

Var. **d. callistomum.** (Dicks.).

Kirkham Hill and Hildenley stone quarry near Malton (Spruce.).

Gunnarside, Upper Swaledale (Barnes).

2. **A. rufescens** (Dicks.). Lindb.(*Dicranum rufescens* Schpr.).

B. Range 1-2.

Wet clay and stony ground, not very rare. Sandstone quarry in Castle Howard Park, growing with *Ditrichum tortile* (Spruce. 1844).

Banks of Whitstondale Beck, near to junction with the Swale (Baker).

In Teesdale, by the stream side near Winch Bridge (Black). Ravens Seat, Upper Swaledale and near Hawnby in Bilsdale, also near Guisbrough, Lingdale, Kilton, Roxby, and Saltburn (Barnes).

On the east slope of Kildale Moor (Mudd.).

Cockmill Wood, Whitby near the bridge (Braithwaite).

Near Mallyon Spout, Goathland, and in Arncliffe Wood, Eskdale (M.B.S.).

Fruiting 9-11 mths.

3. **A. crispum** (Schpr.). Lindb.

(*Dicranum Schreberi* Hedw.).

B. Range 1-2.

Damp clay soil, sides of ditches, rare. In a ditch on the west side of Temple Rush, Castle Howard (Spruce. 1844).

Deepdale and Holwick in Teesdale. Aysgarth Force and Millgill Force, Wensleydale. Kisdon Force, and near Richmond, Swaledale. On the east at Kilton, Easington, and Roxby in Cleveland (Barnes).

Fruiting 9 mth.

Var. **b. elatum** Schpr.

By stream side in branch of Kilton Glen, Cleveland. also Deepdale near Bowes (Barnes. 1866).

Near Terrington (Ingham).

4. **A. squarrosus** (Starke). Lindb.

(*Dicranum squarrosus* Schrad.).

Montane B. Range 1-2.

Stony wet ground by streamlet on moors, not uncommon, rarely found with fruit.

Hagg Syke, Upper Teesdale (Spruce.).

Below Falcon Clints, Teesdale, in fine fruit (M.B.S., Sep. 1873).

On the eastern hills at Saltersgate Beck, fruiting (M. B. S.).
 Boggy ground below High Cliff, Guisbro', and near
 Winch Bridge, Teesdale, fruiting (Barnes).
 Fruiting 8-9 mths. rarely.

Seligeria Br. et Schpr.

1. **S. Donii** (Sm.). C. Muell.

(*Anodus Domianus*. B. et S.).

Montane B. Range 1-2.

On limestone and sandstone rocks amongst both ranges
 of hills, rare. In Teesdale near High Force on the York-
 shire side, first discovered by Mr. R. B. Bowman.

Near Winch bridge, Teesdale, also in the Howardian
 tract in Mowthorpe Dale, and near Crambeck, Castle
 Howard (Spruce. 1843).

Slopes of the Hambleton range at Oldstead and below
 Rolston Scar (Baker).

Hudswell and near Richmond on the Swale, also at
 Aysgarth Force and Whitfield Gill, and at Abbey bridge,
 Rokeby (Barnes).

Fruiting 8 mth.

2. **S. pusilla** (Ehrh.). B. et S.

Montane B. Range 1-2.

Damp shaded rocks of sandstone or limestone, not very
 rare.

Mowthorpe Dale, and near Crambeck, Castle Howard
 (Spruce.).

Forge Valley, and in Raincliff wood near Scarborough
 (Black).

Banks of Goathland Beck and at Rosedale Abbey (Braith-
 waite).

Aysgarth Force, Kisdon Scars, Gunnerside, Hudswell
 and near Richmond (Barnes).

Fruiting 5-6 mths.

3. *S. acutifolia*. Var. *longiseta*, Lindb.

Montane A. Range 1-2.

Fissures of calcareous rocks, rare.

Arncliffe (Whitehead. 1868).

Near Kisdon Force, Upper Swaledale and near Richmond (Barnes 1890).

Fruiting 5-6 mths.

(*S. paucifolia* (Dicks.). Carruth, and *S. calcarea*. (Dicks.). B. et S. have been met with, growing in abundance upon blocks of exposed chalk rock in the East Riding of Yorkshire by Mr. J. J. Marshall, of Market Weighton, 1894.

S. paucifolia (Dicks.) is recorded in Dickson's fourth fasciculus of Cryptogamic plants under the name of *Bryum paucifolium*, from near Wetnerby; there is no recent confirmation of this habitat).

4. *S. trifaria* (Brid.). Lindb.(*S. tristicha* B. et S.).

Montane A. Range 1-2.

Dripping calcareous rocks, rare. Whitfield Gill, and Aysgarth Force, and in hollows on the north side of Addleburgh.

Kisdon Scar near the upper force, Swaledale, and at the head of Semerdale (Barnes. 1889).

Fruiting 5-6 mths.

First noticed as a British moss in Berkeley's Handbook of British Mosses, 1863, as found on calcareous rocks, Blair Athol, by G. E. Hunt.

5. *S. setacea*. (Wulf.). Lindb.(*S. recurvata* B. et S.).

Montane B. Range 1-2.

Shaded sandstone rocks. Frequent upon shaded rocks amongst the hills on both sides of the central valley,

ascending in Arkengarthdale, to the upper part of Punchard's Gill (Baker).

Ganthorpe and on wall near Cum Hagg Wood, Castle Howard (Spruce.).

Saltergate bank top, Troutsdale, and on rocks near Hawnby in Bilsdale (M.B.S.).

Near Kilton and Saltburn (Barnes).

Ingleby Bank, Cleveland (Mudd.).

Fruiting 4-5 mths.

Brachydontium Bruch.

B. trichodes (Web. and Mohr). Furnr.

Montane B. Range 1-2.

Wet sandstone rocks. Very abundant in the sandstone quarry, Castle Howard Park (Spruce. 1842).

Upon the arenaceous rocks of the eastern hills in Cleveland, and upon the southern slopes of the Hambleton range, in numerous places (Baker).

Near Mallyon Spout, Goathland, and on the coast cliffs north of Hayburn Wyke (M.B.S.).

Near Guisbrough and Rushpool, Saltburn, Kilton and Roxby (Barnes).

Fruiting 4 mth.

Blindia (B. et S.

1. **B. acuta** (Huds.). B. et S.

Montane B. Range 2-3.

Crevice of alpine rocks, and amongst stones by mountain rills, not rare. Holwick Scar, and near Winch Bridge, Upper Teesdale (Spruce. 1843).

Dripping rocks of most of the Teesdale Scars, from Maze Beck eastward to Cross-thwaite Beck near Lonton. Whitstondale cliff, and at the waterfall in Punchard's Gill (Baker).

In Cleveland, gathered on Ingleby Bank (Mudd.).

Fruiting 7 mth.

2. **B. trichodes** (Wils.). Lindb.

(*Dicranum trichodes* Wils. M.S.S.).

Montane B. Range 2-3.

Crevices of rocks and amongst stones on moors, near rills, rare, or overlooked.

On wet rocks near Mallyon Spout, Goathland (M.B.S. 1882).

In Teesdale near Caldron Snout, and near Mallyon Spout, Goathland, amongst the eastern hills (Ingham. 1897).

Fruiting rarely—sterile plants have only been met with in North Yorkshire.

(See description and figure of this moss in the supplement to Vol. I. of Braithwaite's British Moss-flora, page 297).

First published as a British Moss in a paper by G. E. Hunt, on Mosses new to Britain, November, 1866, only found sterile.

Didymodon (Hedw.). Web. et Mohr.

D. denudatus (Brid.). Lindb.

(*Dicranodontium longirostrum*. B. et S.).

Montane B. Range 2-3.

On turfy banks and decaying wood in sub-alpine districts, rare.

On rotting tree stump, Hawnby in Ryedale (Barnes. 1896).

Fruiting 8 mth. very rarely

Campylopus. Brid.

1. **C. pyriformis**. (Schultz.). Brid.

(*C. torfaceus*. B. et S.).

B. Range 1-2.

Heaths, moorlands, and by sides of ditches, not uncommon.

Frequent in woods, on turfy soil especially amongst the hills.

Kilburn, Strensall Common (Ingham).

Fruiting 12-5 mths.

2. **C. fragilis** (Dicks.). B. et S.

Montane B. Range 1-2.

Sandstone rock and on turfy soil in sub-alpine districts, not very common.

Near Caldron Snout, Upper Teesdale, and on Stockton forest near York (Spruce.).

Arncliffe Wood, Eskdale, Whitby (Crouch).

On wet stones near Boosbeck, Slape Wath, and at High Cliff, Guisboro', Cleveland (Barnes).

Kilburn, and near Bowes (Ingham).

Fruiting 12-4 mths.

3. **C. flexuosus** (L.). Brid.

B. Range 1-2.

On turfy ground and moist sandstone rocks, not uncommon.

Ganthorpe and Castle Howard Woods (Spruce.).

Arncliffe Wood, Eskdale (M.B.S.).

Seamer Moor near Scarbro' (Webster).

Strensall Common (Ingham).

Fruiting 11-12 mths.

Var. **b. paludosa**. Schpr.

On Seamer Moor near Scarbro' (Webster).

Var. **c. paradoxus**. Wils.

Strensall Common, near York (M.B.S. 1892).

4. **C. setifolus**, Wils.

Montane A. Range 2.

Rocks amongst grass on heaths, rare.

Among Sphagnum on Widdy Bank Fell, Upper Teesdale (Barnes. 1880).

Fruiting 8 mth.

This locality is on the Durham side of the Tees. It is very probable it may be found on the slopes of Mickle Fell on the Yorkshire side of the Tees.

5. *C. atrovirens* De Not.

Montane B. Range 2.

Wet rocks and on peaty ground on the hills, rare.

Cronkley and Holwick Fells (Barnes).

Falcon Clints, Teesdale in Durham (M.B.S. 1853).

Sleights Moor (Braithwaite).

Fruit unknown.

6. *C. brevipilus* B. et S.

C. Range 1.

Moist heaths, not common.

In the central vale on Strensall Common, on the east side (Wilson. 1856).

Fruit unknown.

Dieranoweissia. Lindb.

D. cirrata (L.). Lindb.

(*Weissia cirrata*, Hedw.).

Montane C. Range 1-2.

On old wooden fences, roots of trees, and on rocks and walls, common.

Frequent amongst the hills on both sides of the central valley, and occasionally upon trees and palings in the low country (Baker).

Holwick Scar, Teesdale, Terrington Carr, and in Castle Howard Park (Spruce.).

Levisham Moor, and near Goathland (M.B.S.).

Fruiting 12-3 mths.

Dicranum, Hedw.1. **D. fulvellum** (Dicks.). Sm.*(Arctoa fulvella, B. et S.)*

Montane B. Range 2-3.

Crevices of rocks on the higher hills, rare.

Cronkley Scar, Upper Teesdale (Spruce.).

On the east in Arncliffe Wood, Eskdale, Whitby (Crouch).

Fruiting 7 mth.

2. **D. Schisti** (Gunn.). Lindb.*(D. Blyttii, B. et S.)*

Montane A. Range 2.

Crevices of mountain rocks, rare.

Holwick Scar, Teesdale (Spruce. 1843).

Near Caldron Snout (M.B.S., 1853).

Fruiting 8 mth.

3. **D. falcatum** Hedw.

Montane A. Range 2-3.

Crevices of rocks and stony ground on the higher hills,
rare.

Cronkley Scar, Upper Teesdale (M.B.S. 1853).

Falcon Clints (Barnes).

Fruiting 8-9 mths.

4. **D. Starkei** W. et M.

Montane A. Range 2.

Crevices of rocks and stony ground on the higher hills,
rare.

Holwick Scar, Teesdale (Spruce.).

Fruiting 8 mth.

5. *D. majus*. Smith.

B. Range 1-2.

Banks in woods and on rocks especially amongst the hills, not rare.

In Teesdale and in several of the Castle Howard Woods (Spruce.).

On the East near Mallyon Spout, Goathland, and in Arncliffe Wood, Eskdale (M.B.S.).

Cockmill and Rigg Mill Woods, Whitby (Braithwaite).
Near Helmsley (Ingham).

Fruiting 7-8 mths.

6. *D. scoparium*. (L.). Hedw.

B. Range 1-3.

Shady banks in woods, and amongst rocks, and upon heaths, common, from the low country upwards to the peak of Mickle Fell (Baker).

Varies much in size, several varieties of it are enumerated in Braithwaite's British Moss-flora, some of which may probably be found amongst the heaths and hills of North Yorkshire.

Fruiting 7-8 mths.

Var. *spadiceum* Zetterst.

On Cronkley Fell, Upper Teesdale (Wheldon. 1894).

7. *D. Bonjeani* De Not.

(*D. palustre* Brid.).

B. Range 1-2.

Wet heathy moors.

Frequent upon damp heaths, ascending from Pilmoor and Stockton forest to the plateau of Pin Seat (Baker).

Welburn Moor, Castle Howard (Spruce.).

Hawnby and Codhill Bog (Barnes).

Strensall Common, Askham Bog, Kilburn (Ingham).

Fruiting 7-8 mths.

Var. **b. juniperifolium** (Sendt.).

In sand pit in a fir plantation on Stockton forest, near York (Spruce. 1842).

Var. **c. calcareum**, Braithwaite.

Near Hawnby in Bilsdale (Wheldon 1883).

8. *D. spurium* Hedw.

C. Range 1.

Wet heaths in the low country, not common, but plentiful locally, very rarely fruiting.

Stockton Forest, near York, fruiting (Spruce. 1842).

Strensall Common (Slater and Stabler).

Pilmoor and in the Howardian tract on Coulton Moor (Baker).

Fruiting 7 mth.

9. *D. congestum*. Var. **b. flexicaule** Brid.

Montane A. Range 2.

Mountain rocks, rare.

Near the High Force, Upper Teesdale (Spruce. 1843).

Fruiting 8 mth.

10. *D. fuscescens* Turner.

Montane B. Range 2-3.

Sandstone crags, and occasionally on trees. Frequent upon the arenaceous crags of both the eastern and western range of hills, ascending to the upper zone of Mickle Fell (Baker).

Holwick Scar, Teesdale (Spruce.).

Blueberry Gill, Goathland, and Cronkley Gill, Eskdale (M.B.S.).

Fruiting 7 mth.

Var. **b. falcifolium** Braithwaite.

Holwick Scar, Teesdale (Spruce.).

Easby Moor, on the east (Barnes).

11. **D. Scottii** Turner.

Montane B. Range 1-2.

Shady sub-alpine rocks, rare.

In the sandstone quarry, Castle Howard Park (Spruce.).

On sandstone rocks, High Cliff, Guisbro', Cleveland (Mudd.).

Slape Wath (Barnes).

Fruiting 7-8 mths. very rarely.

12. **D. flagellare** Hedw.

C. Range 1.

Peaty places on rocks amongst the hills, rare

Rocks, Kildale, Cleveland (W. Mudd.).

Fruiting 8 mth.

Dichodontium Schimp.1. **D. pellucidum** (L.). Schimp.

(*Dicranum pellucidum* Hedw.).

B. Range 1-3.

Upon damp rocks, by sides of streams, common.

Ascending to the main limestone of Mickle Fell (Baker).

Scawton Howle, Helmsley, also at Hackness, near Scarbro', and in Eskdale (Spruce.).

Saltergate Beck (Anderson).

On wet rocks, by Guisbro' Beck (Barnes).

Fruiting 10-11 mths.

2. **D. flavescens**. (Dicks.). Lindb.

B. Range 1-3.

On stones and gravel, in wet places by streams, not so plentiful as the preceding.

By streams in Eskdale (Spruce. 1842).
 Near Thirsk, and in Wensleydale (Baker).
 Saltersgate Beck (M.B.S.).
 Hagg Beck, Kilton Wood, Cleveland (Barnes).
 Near Mallyon Spout, Goathland (Ingham).
 Fruiting 8. mth.

Oncophorus Brid. (*Dicranum* Hedw.).

1. **O. strumifer** Brid. (*D. strumiferum* Ehrh.).

Montane A. Range 2-3.

Wet crevices of rocks on the higher mountains, rare.
 On fallen basaltic rock at the base of Holwick Scar,
 Upper Teesdale (Spruce. 1843).
 Fruiting 8 mth.

2. **O. polycarpus** (Ehrh.). Brid.

(*Dicranum polycarpum* Ehrh.).

Montane A. Range 2.

Clefts of mountain rocks, rare.
 On Holwick Scar, Upper Teesdale (Barnes).
 Fruiting 6-7 mths.

3. **O. Bruntoni** (Smith). Lindb.

(*Cynodontium Bruntoni* B. et S.).

Montane B. Range 1-3.

Clefts of rocks in sub-alpine districts.
 Upon most of the Teesdale Scars, from Cronkley east-
 ward to Crosswaite Beck. In Deepdale, upon the gritstone
 crags of Cat-Castle (Baker).
 On the east, on rocks at the head of Newton Dale
 (Spruce. 1843).

On sandstone rock, on the Kildale side of Easby Moor,
 Cleveland (Barnes).

Fruiting 7-8 mths.

4. **O. crispatus** (Dicks.). Lindb.
(*Rhabdoweissia denticulata* B. et S.).

Montane A. Range 2.

Crevices of sub-alpine rocks, rare.

Above High Force, on basaltic rock by the Tees
(M.B.S. 1853).

Unthank Scars, and Falcon Clints, Teesdale (Barnes. 1890).

Fruiting 6-7 mths.

5. **O. striatus** (Schrad.). Lindb.
(*Rhabdoweissia fugas*, B. et S.).

Montane A. Range 2.

Fissures of rocks in sub-alpine districts, rare.

Holwick Scar, Teesdale (Slater and Anderson, 1853).

Cronkley Scar, Upper Teesdale (Barnes. 1890).

Fruiting 6-7 mths.

Ceratodun Bridel.

1. **C. purpureus** (L.). Brid.

B. C. Range 1-3.

Common upon heaths especially in places where the heather has been burnt and on gravelly soil, on walls and rocks.

Ascending from the Central Valley to the upper zone peaks (Baker).

Fruiting 4-5 mths.

Var. **brevifolius**, Milde.

Coatham Marshes (Ingham).

2. **C. conicus** (Hampe.). Lindb.

C. Range 1.

Walls and waste ground, rare or overlooked.

Near Hackness, fruiting (W. Ingham, 1897).

On the Hambleton Hills, at Kilburn, sterile (W. Ingham, 1898).

On cliff near Cayton Bay (G. Webster, 1905).

Fruiting 4-5 mths.

FAM. 8. TORTULACEÆ.

Ephemerum Hampe. (*Phascum*, Schreb.).

1. **E. serratum** (Schreb.). Hampe.

(*Phascum serratum* Schreb.).

C. Range 1.

Damp clay fields and ditch banks in the low country, not very common.

Waste ground in Cum Hagg Wood and on Welburn Bank, Castle Howard (Spruce. 1837).

Hob Hill near Saltburn (Barnes).

Fruiting 12-2 mths.

Acaulon C. Muell. (*Phascum* Schreb.).

1. **A. muticum** (Schreb.). C. Muell.

(*Phascum muticum* Schreb.).

B. Range 1.

Sandy clay in open grassy places, not common.

Ditch near Temple rush, Castle Howard; on damp ground near the Castle Howard Railway Station, also near York (Spruce.).

Banks between Aske and Richmond (Ward).

Lingdale, Roxby, and near Saltburn in Cleveland (Barnes).

Fruiting 2-3 mths.

Phascum (L.). Schreb.

1. **P. acaulon** L. (**P. cuspidatum**. Schreb.).

B. Range 1-2.

Frequent on waste ground, both in the low country and amongst the hills (Baker).

Near Ganthorpe, Castle Howard (Spruce. 1837).

Near Malton (M.B.S.).

Near York (Wheldon).

Fruiting 11-12 mths.

2. **P. Floerkei**. Web. Mohr.

C. Range 1.

Damp fallows, rare.

On fallow ground at Bulmer Hagg, near Castle Howard (Spruce. 1844).

Near Pickering (G. Webster).

Fruiting 11-12 mths.

Var. **b. badium** (Voit.). Brid.

Found with the normal form at Bulmer Hagg (Spruce.).

3. **P. curvicolle** Ehrh.

C. Range 1.

Moist banks in quarries or fields, not common.

Magnesian limestone quarry near Tanfield West Station (L. J. Cocks. 1896).

Fruiting 3-4 mths.

Pottia Ehrh.

1. **P. recta** (With.). Mitt.

(*Phascum rectum* Sm.).

C. Range 1.

On clayey fields, and damp banks by road sides, rare.

In the central valley near York (Spruce.).

Magnesian limestone quarry near Tanfield West Station (L. J. Cocks. 1896).

Fruiting 2-3 mths.

2. *P. bryoides* (Dicks.). Mitt.*(Phascum bryoides* Dicks.).

C. Range 1.

Fallow fields and damp banks, not common.

On waste ground near Ganthorpe, and in quarries at Welburn, near Castle Howard (Spruce. 1841).

Near Malton (M.B.S.).

Fruiting 1-3 mths.

3. *P. Heimii* (Hedw.). Turnr.

C. Range 1.

Moist gravelly banks by the sea, and damp places not common.

On the multangular tower at York (Spruce.).

In the salt marshes at Middlesbro', and Coatham, and on both sides of the Esk at Whitby (Baker).

Inland at Croft, and by the sea at Saltburn (Barnes).

Plentiful amongst the Redcar Sandhills (W. Mudd.).

Fruiting 4-5 mths.

4. *P. truncatula* (L.). Lindb.

C. Range 1.

Fallow ground in fields and gardens, on corn stubble in damp fields and on hedge banks, frequent.

Fruiting 1-3 mths.

5. *P. intermedia* (Turn.) Fuernr.

C. Range 1.

On similar sites to the preceding, on banks and walls not so common.

Near Thirsk (Barnes. 1894).

Fruiting 12-3 mths

6. **P. lanceolata** (Hedw.) C. Muell.*(Anacalypta lanceolata, Rohl.)*

C. Range 1.

Not uncommon on earthy banks in the low country.

Near Castle Howard (Spruce).

Near Malton (M.B.S.).

Near York, Great Ayton, Richmond, &c. (Baker).

In Cleveland at Skinningrove, and near Saltburn (Barnes).

Fruiting 2-4 mths. •

7. **P. Starkei** (Hedw.) C. Muell.*(Anacalypta Starkeana, N. and H.)*

C. Range 1.

Fallow fields and banks, not common.

In the central vale at Clifton Scope, near York (Spruce).

Var. γ . **Davallii** (Sm.) Lindb.*(Pottia minutula, Schimp.)*

Clay soils and on corn stubble, more common than the normal form.

Near York and Castle Howard (Spruce)

Near Thirsk (Baker)

Near Malton and Pickering (M.B.S.)

Near Saltburn (Barnes)

Fruiting 12-3 mths.

Tortula Hedw.1. **T. pusilla** (Hedw.) Mitt.*(Pottia cavifolia, Ehrh.)*

C. Range 1-2.

Not uncommon on banks and mud-capped walls, in calcareous districts.

Near Welburn and Ganthorpe, Castle Howard (Spruce.)
Mud-capped walls near Malton, also near Pickering and
Snainton, on similar sites (M.B.S.)

On banks and walls at Skelton and Saltburn (Barnes).

Near Kilburn (Ingham)

Fruiting 1-3 mths.

2. *T. lamellata* Lindb.

(*Pottia cavifolia*, var. *gracilis*, Wils.).

C. Range 1-2.

On mud-capped walls, sometimes growing with the
previous moss, but rarer.

Near Castle Howard (Spruce)

On walls at Helmsley (Wesley)

Fruiting 1-2 mths.

3. *T. stellata* (Schreb.) Lindb.

(*T. rigida*, Schrad.).

C. Range 1-2.

Mud-capped walls and rocky banks in calcareous districts.

At Crambeck. Castle Howard, and near Hovingham;
also near Malton, and at Scalby near Scarbro' (Spruce.
1843)

Mud-capped walls on the east along the middle oolite
in several places (Baker).

Fruiting 9-3 mths.

(*T. brevirostris* Hook. Grev.

This rare species belonging to this section has been
found at Kiplingcotes near Market Weighton, in the East
Riding, by J. J. Marshall, October, 1895).

4. **T. ericaefolia** (Neck.) Lindb.*(T. ambigua, B. et S.)*.

C. Range 1.

Mud-capped walls in calcareous districts and marly banks, not very common.

Welburn, Castle Howard, Malton, and near York (Spruce. 1845).

Near Kirbymoorside (Baker).

On Seamer Moor near Scarbro' (Wheldon).

On clay banks near Saltburn (Barnes).

Fruiting 11-3 mths.

5. **T. aloides** (Koch) De Not.*(T. rigida, Sm.)*.

C. Range 1.

Clay banks and wall tops, not rare.

Crambeck and Welburn, Castle Howard, also near Malton (Spruce. 1843).

Clay banks near Masham (Mudd).

Near the summit of Wass bank and Hood hill and plentiful in several places from Byland Abbey eastward along the middle oolite (Baker).

In Cleveland on clayey ground above Marske Mill, also near Skelton and Saltburn (Barnes).

Near Scarbro' (Wheldon).

Fruiting 11-12 mths.

6. **T. marginata** B. et S.

C. Range 1-2.

Sandstone rocks and walls, not common. In the sandstone quarry in Castle Howard Park, and frequent about the base of walls built from the same sandstone near Coneysthorpe (Spruce 1843)

In the central vale on sandy ground at Leckby, and on the slope of the Hambleton Hills, on rocks below Whitstoncliff, also at Rolston Scar, and near Oldstead (Baker).

On sandstone walls near Ebberston (M.B.S.).

In Cleveland near Upleatham, also on the north wall of Thirsk Church, and at Kilvington Mill (Barnes).

Fruiting 5-6 mths.

7. **T. muralis** (L.) Hedw.

B. Range 1-2.

Everywhere common on walls and rocks, and sometimes on trees amongst other mosses.

Fruiting 4-5 mths.

Var β **rupestris** (Schultz.).

Not uncommon. Wet shaded rocks and walls amongst the hills and near the coast.

At Scalby, near Scarbro', also in the Eskdale district near Egton, Goathland and Whitby (M.B.S.).

Var. γ **æstiva** (Brid.).

Near Rokeby (R. Barnes).

(**Tortula cernua** (Hueb.). Lindb.

(*Desmatodon cernuus*, B. et S.).

This is one of the latest additions to the British Moss Flora. It was met with in the West Riding of Yorkshire, in small quantity only, on the Magnesium limestone near Aberford, last autumn, by Mr. George Webster of York (Sep. 1900).

A good account of its discovery is given in the January number of the Naturalist for 1901, to which readers may refer, and now attention having been drawn to it, possibly it may be found in other districts.)

Fruiting 8-10 mths.

8. *T. subulata* (L.). Hedw.

B. Range 1-2.

Damp, sandy and clay banks, by roadsides and hedges frequent.

Upon shaded banks ascending to the main limestone scars of Punchard's Gill (Baker).

Near Kilburn (Ingham).

Fruiting 5-6 mths.

9. *T. angustata*. Wils.

C. Range 1-2.

Damp banks, rare.

Between York and Skelton, and at Clifton Scope, York (Spruce. 1843).

Occasionally on hedge banks near Richmond and Thirsk. In the Cleveland district, in several localities at Kilton, Guisbro', Grinkle Park, Slape Wath, and Saltburn (Barnes).

Fruiting 3-4 mths.

10. *T. mutica*. Lindb.(*T. latifolia*, Hartm.).

B. Range 1.

Tree trunks, and on decayed wood at the edge of streams, not common, and very rarely fruiting.

Banks of the Ouse near York (Spruce. 1843).

Banks of the Derwent near Malton, and on tributary streams (M.B.S.).

Banks of Swale, Wiske, Yore, and Esk (Baker).

In Cleveland near Saltburn (Barnes).

Fruiting 5 mth., very rarely.

11. *T. papillosa*. Wilson.

C. Range 1.

Trunks of trees in small scattered tufts, not common, but always sterile, and liable to be overlooked.

On old elms near York, and on trees near Castle Howard Park (Spruce 1843).

On trees near Thirsk (J. H. Davies).

On thorns near the Mere at Scarbro' (Nowell).

On trees in hedgerows near Malton (M. B. S.).

On an ash tree near Saltburn, also near Roxby and Hawnby (Barnes).

Sterile.

Dr. Braithwaite records in a note in his *British Moss-flora* (Vol. I. page 223) that the fruit of this moss has only been found at Sealers Cove, in Australia, by Baron Von Mueller, and at Canterbury, New Zealand, by Sinclair and Haast.

12. *T. laevipila* (Brid.). Schwagr.

B. Range 1-2.

Trunks of trees, and sometimes on rocks; common. Frequent upon trees and also on walls in the low country (Baker).

Fruiting 5-6 mths.

13. *T. montana* (Nees.). Lisdb.

(*Barbula intermedia*, Milde.).

B. Range 1-2.

Limestone rocks and walls; not common. In the Swale district, at Keld, Hudswell, near Richmond Moor, and in Cleveland near Saltburn. On walls near Helmsley and Hawnby (Barnes).

Kilburn and Terrington (Ingham).

Fruiting 4-5 mths.

14. *T. ruralis* (L.). Ehrh.

C. Range 1-3.

Common upon old thatched roofs and sandy banks, ascending from the coast sand hills to the limestone pavement of Cam Fell (Baker).

Fruiting 4-5 mths.

Var. β . **arenicola**, Braithwaite.

Sea banks at Saltburn, and sand hills near Redcar (Barnes).

15. **T. princeps**. De Not.

Montane A. Range 2-3.

On rocks, rare. Green Fell, Upper Teesdale (Barnes. 1887).

Fruiting 4-5 mths.

Mollia (Schrank.). Braithwaite.

Includes the genera *Systegium*, Schpr. ; *Phascum*, Brid. ; *Weissia*, Hedw. ; *Eucladium*, B. et S. ; *Trichostotum*, Bruch. ; *Didymodon*, B. et S. ; *Tortula*, Hedw. ; ex parte).

1. **Mollia crispa** (Hedw.). Lindb.

(*Phascum crispum*, Hedw.).

C. Range 1.

By the edge of paths in woods, and clay fields, rare.

In fields at Great Ayton in Cleveland (Mudd.).

Near Saltburn, and on clay bank near Thirsk (Barnes.).

Also near Rokeby.

Fruiting 4-5 mths.

2. **Mollia microstoma** (Hedw.). Lindb.

(*Gymnostomum microstomum*, Hedw.).

Montane B. Range 1-2.

On sandy banks and waste ground, not very common.

Playground of St. Peter's School, York, and near the High Force, Teesdale. On the Howardian tract near Ganthorpe, and near the church and elsewhere, on sandy grassy sites at Welburn (Spruce. 1844).

In the west field near Richmond (Ward).

In Cleveland, on clay ground at Roxby and Saltburn (Barnes).

Fruiting 3-4 mths.

Var. **obliqua**, C.M.

Strensall Common (Ingham).

3. **Mollia squarrosa** (Nees. Hornsch.). Lindb.

(*Gymnostomum squarrosum*, Wils.).

C. Range 1-2.

Clay banks, not common.

On clay banks near Saltburn (Barnes).

Fruiting 10-3 mths., rarely.

4. **Mollia crispata** (Nees. Hornsch.). Lindb.

(*Hymenostomum crispatum* Nees. Hornsch.).

Montane A. Range 2.

In the crevices of rocks and banks, not common.

Gilmanscar near Bowes, July, 1903 (W. Ingham).

Fruiting 4-6 mths.

5. **Mollia viridula** (L.). Lindb.

(*Weissia viridula*, Hedw.).

B. Range 1-2.

Common upon sandy banks, road sides, and heathery ground, both in the low country and amongst the hills (Baker).

Fruiting 3-5 mths.

Var. β . **densifolia**, Wils.

Kisdon Force, Swaledale, and near Winch Bridge and Eppersgill Beck, Teesdale (Barnes).

6. **Mollia rutilans** (Hedw.). Lindb.

(*Weissia mucronata*, B. et S.).

C. Range 1.

Clay ground in shaded places, rare.

At Hackness near Scarbro' (Spruce. 1843).

In Cleveland, by the side of the road, between Grinkle Park and Loftus; also on clay ground at Slape Wath and Saltburn (Barnes 1890).

Fruiting 3-4 mths.

7. **Mollia tenuis** (Schrad.) Lindb.

(*Gymnostomum tenue* Schrad.).

B. Range 1-2.

Rocks and stones of sandstone or limestone, not common.

On Sandy Hill Bridge, Castle Howard Park, also in quarries at Welburn and Appleton-le-Street (Spruce. 1843).

Near Richmond, Thorpe Arch, Sutton Bank, and Thirsk (Baker).

At Hawaby in Bilsdale, also in quarry near Easthorpe, Malton, and near Pickering (M.B.S.).

In Cleveland, at Kilton, Roxby, Skelton, Saltburn, Slape Wath and Upleatham, also in Deepdale, and at Gainford and Croft (Barnes).

Fruiting 7-8 mths.

8. **Mollia æruginosa** (Sm.) Lindb.

(*Gymnostomum rupestre*, Schleich.).

Montane B. Range 1-2.

Wet rocks near waterfalls, especially in calcareous sub-alpine districts; not uncommon.

At High Force and Hell Cleft, also near Winch Bridge, Teesdale (Spruce. 1843).

In Greta Dale at the falls below Sleightholme, Whitstone-dale Scars, and in most of the glens of the Yore district (Baker).

At Saltersgate Beck, and in various places near waterfalls on the streams in Eskdale, Whitby (M.B.S.).

By the Tees, descending to Whorlton Bridge, Ovington, and Gainford (Barnes).

Fruiting 8-9 mths.

9. *Mollia verticillata* (L.) Lindb.*(Eucladium verticillatum, B. et S.)*

Montane. Range 1-2.

Dripping calcareous rocks, not very uncommon, but rarely fruiting.

Ascending from the central vale to the western slope of Mickle Fell (Baker).

On dripping rocks at Crambeck, near Castle Howard, and at Goathland, and near Hackness (Spruce).

In quarry at Middleton, near Pickering (M. B. S.).

At Gainford on the Tees, and in Cleveland at Kilton, Roxby, and Saltburn; fruiting (Barnes).

Fruiting 6-7 mths.

10. *Mollia crispula* (Bruch) Lindb.*(Trichostomum crispulum, Bruch)*

Montane. Range 1-2.

Rocks and banks in calcareous districts, and near the sea coast; rare.

Amongst the coast cliffs north of the Mill at Scalby, near Scarbro' (Spruce).

At Aysgarth Force, and on sea banks at Kilton and Saltburn; fruiting near Bowes (Barnes).

Fruiting 5-6 mths., very rarely.

Var. *β. nigro-viridis*, Braithwaite.

On Cronkley Scars, and near the White Force, Upper Teesdale (Barnes).

11. *Mollia litoralis* (Mitt.) Braithwaite.*(Trichostomum litorale, Mitt.)*

Montane. Range 1-2.

Banks and woods often near the sea coast.

On Cronkley Scar, and by the side of the river at Ovington, Teesdale.

In Cleveland on rocks by the streams at Easington, Kilton, and Roxby (Barnes. 1887).

Fruiting 3-4 mths.

12. **Mollia brachydontia** (Bruch) Lindb.

(*Trichostomum mutabile*, Bruch).

Montane and Maritime. Range 1-2.

On calcereous rocks often near the sea coast.

Near Welburn Mill, Castle Howard, in Eskdale, and at Scalby Mill, near Scarbro' (Spruce. 1843).

Maze Beck Scars, Upper Teesdale, also north side of Addleborough (Barnes. 1887).

Fruiting 4-6 mths.

13. **Mollia tenuirostris** (Hook. and Tay.) Lindb.

(*Didymodom cylindricus*, B. et S.).

Montane C. Range 1-2.

Damp shaded rocks, and by waterfalls; not uncommon; rare in fruit.

In Eskdale on stones in Lythe Beck (Spruce).

Near High Force and Unthank Beck, Teesdale.

On rocks in Easington Gill, and at Roxby, and near Saltburn. Near Hawnby, in Bilsdale; fruiting (Barnes).

Fruiting 10 mths.

Var. γ **Holtii**. Braithwaite.

Wet ground near Widdy Bank, Teesdale (Barnes 1886).

14. **Mollia nitida** Lindb.

(*Trichostomum nitidum*, Schpr.).

Montane. Range 1-2.

Calcareous rocks and walls; rare.

In Swaledale on limestone walls at Keld, Hudswell Moor, and near Richmond (Barnes. 1890).

At Peak Cliff, on the east coast, near Robin Hood's Bay (M.B.S. 1888).

Deepdale, Askrigg, and Semerdale (Barnes).

Not found fruiting.

15. *Mollia inclinata* (Hedw. f.) Lindb.

(*Barbula inclinata*, Schwgr.).

Montane. Range 2-3.

On rocks; rare.

On the sugar limestone at Cronkley Fell, Upper Teesdale (Spruce. 1843).

Sterile.

16. *Mollia tortuosa* (L.) Schrank.

(*Tortula tortuosa*, Ehrh.).

Montane B. Xerophilous. Range 1-3.

Rocks, especially calcareous, frequent, but very rarely fruiting.

Common on both sides of the central valley, ascending from the Magnesium limestone, to the limestone pavement of Cam Fell, and Widdale Fell. Upon the gritstone in Punchard's Gill. Amongst the eastern arenaceous hills at Ingleby bank, on the slope of Black Moor, and over Newton Dale (Baker).

Wood above Rosedale Abbey, in fruit (Braithwaite).

Found in fine fruit at Kisdon Scars, Upper Swaledale (Barnes).

Fruiting 7 mth.

Var. δ *fragilifolia* (Juratz.).

Near Hawnby in Bilsdale (Wheldon. 1882).

Leptodontium Hampe.1. **L. flexifolium** (Dicks.) Hampe.*(Didymodon flexifolium* Hook. and Tay.).

Montane B. Range 1-2.

Bare gravelly and turfy places, rare.

In Cleveland, in turfy places on Ayton Moor (Mudd).

On Easby Moor, fruiting (Barnes).

Upon the moors at the head of Bilsdale (Dalton, Jnr.).

Moor above the Foss reservoirs (Baker).

Easter side Hawnby (Barnes).

Fruiting 2-4 mths.

Barbula Hedw.1. **B. curvirostris** (Ehrh.) Lindb.*(Gymnostomum curvirostrum* Hedw.).

Montane B. Range 1-2.

Alpine calcareous rocks, not common.

Ettersgill Beck and Hell Cleft, Teesdale; also on the east at the upper part of Newton Dale (Spruce).

Punchard's Gill, and very fine at Kisdon Force, and in the lower part of East Stonesdale, Hardraw Force, &c. (Baker).

Near Rokeby (Barnes).

Fruiting 9 mth.

Var. β **commutata** (Mitt.) Lindb.

In the Tees district it descends to below Gainford, where it grows in great luxuriance and fruits abundantly.

Found also in East Gill, Upper Swaledale, and in Whitfield Gill, Wensleydale (Barnes).

Hardraw Force (L. J. Cocks 1896).

2. **B. rubella** (Hoffm.) Mitt.*(Didymodon rubellus, B. et S.)*.

Montane. Range 1-3.

Walls, rocks, chiefly sandstone, and stony ground abundant.

Common upon rocks and hedge banks ascending from the low country to the limestone scars of the northern slope of Mickle Fell, and the pavement of Cam Fell (Baker).

Coatham Marshes abundant (Ingham).

Var. β **dentata** Schpr.

On stones, near Coneysthorpe, Castle Howard (Spruce 1878).

Fruiting 8-9 mths.

3. **B. lurida** (Hornsch.) Lindb.*(Didymodon luridus, Hornsch.)*.

Montane. Range 1-2.

Limestone walls and crumbling sandstone, not common. Near Welburn, Castle Howard (Spruce 1847).

On stones at Coneysthorpe, and in Castle Howard Park (M.B.S.).

By the Tees near Gainford and Ovington, fruiting also near Richmond, and in Cleveland at Upleatham, Slape Wath, Guisbro', Coatham, and Saltburn; fruiting (Barnes).

By Bedalé Beck (Wheldon).

Fruiting 11-12 mths.

4. **B. brevifolia** (Dicks.) Lindb.*(Trichostomum tophaceum, Brid.)*.

Range 1.

Damp rocks and walls, also near the sea coast, not uncommon.

Near York, at Crambeck, Castle Howard, and on the sea coast near Scalby Mill (Spruce).

Raincliff Wood near Scarbro' (Black).

In the ravine at Hayburn Wyke, near Scarboro' (M.B.S.).

In Cleveland, amongst the coast sandhills, near Redcar (Mudd).

In Loftus Wood (Braithwaite).

On the Alum rock beyond Sandsend, near Whitby (Anderson).

Var. β **acutifolia** Schpr.

On moist sandstone rock at Loundsdale and Saltburn (Barnes).

Fruiting 10-2 mths.

5. **B. fallax** Hedw.

Range 1-3.

Wet clay and sandy banks, and at the base of walls, frequent.

Common upon heathy banks, ascending from the low country to the limestone pavement of Cam Fell (Baker).

Fruiting 10-1 mths.

Var. γ **brevifolia** (Sm.) Schultz.

Strensall Common (Ingham).

6. **B. reflexa** Brid.

(*B. recurvifolia* Schpr.).

Montane. Range 1-2.

On limestone rocks, rare.

In quarry near Welburn, Castle Howard (Spruce 1844).

In Teesdale, on the summit of Green Fell, Upper Teesdale. In Swaledale on an old limestone wall near Kisdon

Force, at Whitfield Gill in Wensleydale, also at Aysgarth Force (Barnes 1890).

Clifton near York (Ingham).

Rarely fruiting. Only found sterile in Yorkshire.

7. *B. spadicea*, Mitt.

(*Trichostomum rigidulum* Sm. ex parte.).

Range 1-2.

Damp walls, rocks, and sandy banks of streams, not common. By the Tees at Gainford, and near the Abbey bridge, Rokeby. In Cleveland, not unfrequent by the sides of streams at Easington, Kilton, Roxby, Skelton and Saltburn (Barnes).

In Eskdale at Arncliffe, and by the sides of other tributary streams of the Esk near Whitby (M.B.S.).

Fruiting 9-11 mths.

8. *B. rigidula* (Hedw.) Mitt.

(*Didymodon rigidulus* Hedw.).

Range 1-3.

Damp rocks and shaded walls in calcareous districts, not uncommon.

In the low country, and amongst the hills ascending to the main limestone scars of Mickle Fell (Baker).

Walls in the Castle Howard district, also in Teesdale and near Scalby Mill, Scarbro' (Spruce 1843).

At Richmond, Gunnerside, and Brompton on the Swale; also in Cleveland, at Kilton, Roxby and Saltburn (Barnes).

Fruiting 7-9 mths.

9. *B. cylindrica* (Tay.) Schpr.

Range 1-2.

On walls, especially in limestone districts, not common.

Walls at Ganthorpe and Crambeck, and in other Castle Howard woods (Spruce).

On wall at Kildale in Cleveland (M.B.S.).

Occasionally upon banks and sandy rocks in the low country (Baker).

Var. β *vinealis* Brid.

In hilly districts. In the Castle Howard neighbourhood in several places, also on walls above Barnard Castle in Teesdale (Spruce 1843).

On stones by the banks of the Greta (M.B.S.).

Sutton near Thirsk (Wheldon).

Fruiting 6 mth.

10. *B. sinuosa* (Wils.).

(*Didymodon sinuosus* Schpr.).

Range 1-2.

On old walls, wet stones, and about tree roots in calcareous districts, not common.

On stones in Castle Howard Park (M.B.S.).

In Teesdale by the side of the Unthank Beck, and by the river-side at Ovington, Winston, and Croft. In Swaledale at Kison Force, Hudswell, Whitcliff Woods, and Sandbeck, Richmond. In Cleveland at Easington and Saltburn (Barnes).

At Askrigg and Leyburn in Wensleydale.

Always without fruit.

11. *B. Hornschuchii* Schultz.

Range 1.

On damp sandy ground, and on old walls, not common.

On Kirkham Hill, and at Crambeck, Welburn and Coneysthorpe, Castle Howard (Spruce 1839).

On sandy banks near Huttons Ambo, Malton (M.B.S.).

Var. *aristulata* Spruce M.S.S.

On damp sandy banks near Coneysthorpe, Castle Howard (M.B.S.).

Fruiting 4-5 mths.

12. **B. revoluta** (Schrad.) Brid.

Range 1-2.

Limestone walls, and the mortar joints of brick walls in calcareous districts, not very common.

On mud-capped walls at Welburn, Castle Howard (Spruce).

On limestone walls near Richmond, and near Limekiln Wood, Catterick on the Swale, also at Aysgarth Force and Hawes in Wensleydale (Barnes).

Walls in Upper Teesdale.

Fruiting 4 mth.

13. **B. convoluta** Hedw.

Range 1-2.

On bare places amongst short grass, and on heathery grounds.

Frequent both in the low country and amongst the hills.

Fruiting 4-5 mths.

14. **B. unguiculata** (Huds.) Hedw.

Range 1-2.

Upon hedge banks, bare ground, and shaded rocks and walls, in the low country and amongst the hills, frequent.

Var. β **cuspidata** (Schultz).

On gravelly banks, not uncommon.

Fruiting 12-2 mths.

15. **B. mucronata** (Brid.) Lindb.

(*Barb. Brebissoni*, Brid.).

Range 1.

At roots of old trees by river sides, rare.

Near Egglestone Bridge, Teesdale (Spruce 1843).

Fruiting 5 mth.

Cinclidotus P. Beauv.1. **C. fontinaloides** (Hedw.) P. Beauv.

Montane C. Range 1-2.

Attached to wood on stones in streams, especially in limestone districts. Mountain rivulets in the North and West Ridings.

In rivulets above Helmsley (R. Teasdale 1798).

In the Ouse near Bishopthorpe, York, and in streams at Crambeck, Castle Howard (Spruce 1842).

Plentiful in the streams of the western dales where they break through the limestone, ascending to the plateau of Holwick Fell; descending with the Swale to Aisenby, and the Yore to Ripon (Baker).

On the East in Hell Gill, Guisbro' moor (Mudd).

Fruiting 4-5 mths.

Var. β **pseudaquaticus**, Ingham.

Wall by a waterfall at Hawes.

Wensleydale (Ingham. 1900).

Leersia Hedw. (*Encalypta* Schrad.).1. **L. exstinctoria** (L.) Leyss.

(*Encalypta vulgaris* Hedw.).

Range 1-2.

Walls covered with earth, banks and rocks, not uncommon.

Frequent upon walls and dry banks, especially amongst the hills (Baker).

The rarer form having the peristome perfect near Welburn Mill, Castle Howard (Spruce).

Var. β **pilifera** (Funck.).

On dry limestone rocks near Kisdon Scar, Upper Teesdale (Barnes 1890).

Fruiting 3-5 mths.

2. **L. laciniata** Hedw.
(*Encalypta ciliata* Hoffm.).

Montane A. Range 2-3.

On rocks in sub-alpine districts, rare.

Near Cronkley Fells and in Ettersgill Beck, Teesdale (Spruce).

On Falcon Clints (Slater and Anderson).

Upon most rocks of the Teesdale cliffs ascending to the main limestone of Mickle Fell; descending to the Tees side below Holwick. In the Yore district, upon the scars of Mossdale, Addleborough, and Waldendale (Baker).

Fruiting 6-7 mths.

3. **L. rhabdocarpa** (Schwaegr.) Lindb.
(*Encalypta rhabdocarpa* Schwaegr.).

Montane A. Range 1.

On rocks in Alpine districts, rare.

In an old quarry by the roadside, about a mile from Bowes, on the road to Greta Bridge (M.B.S. 1879).

Gilmanscar Cliff, near Bowes (Ingham 1903).

Fruiting 7-8 mths.

4. **L. contorta** (Wulf.) Lindb.
(*Eucalypta streptocarpa* Hedw.).

Montane B. Subxerophilous. Range 1-3.

Rocks, walls, and gravelly banks, especially on limestone.

In old quarries of limestone in the Castle Howard Woods and district (Spruce).

Frequent upon walls, and in the crevices of rocks amongst the limestone hills on both sides of the central valley ascending to the northern slope of Mickle Fell. Occasionally upon the gritstone lias and lower Oolite, as at Boltby and Huthwaite, and in Stogdale and Westerdale (Baker).

Fruiting 8 mth., very rarely.

FAM. 9. WEBERACEÆ.

Webera Ehrh. (*Diphyscium* Mohr.).1. **W. sessilis** (Schnid.) Lindb.(*Diphyscium foliosum* Mohr.).

Montane B. Range 2.

Turfy banks and moist rocks in hilly districts, rare.

In Teesdale on Holwick Scars, and by the stream side at the fall of Maze Beck, and near High Force (Baker).

On the east gathered in Loundsdale (Mudd).

Banks of Whitstondale Beck, Upper Swaledale (Barnes).

Fruiting 8 mth.

FAM. 10. GRIMMIACEÆ.

Grimmia Ehrh. (*Schistidium* and *Racomitrium*).1. **G. apocarpa** (L.) Hedw.(*Schistidium apocarpum* B. et S.).

B. Range 1-3.

Rocks and walls, frequent.

Common, ascending from the central valley to the main limestone of Mickle Fell, Cam Fell, and Widdale Fell (Baker).

Var. γ **rivularis** (Brid.) W. et M.

Not unfrequent in streams (Baker).

In a cascade in Castle Howard Park, and near Winch Bridge, Teesdale (Spruce).

Fruiting 12-3 mths.

2. **G. maritima** Turn.(*Schistidium maritimum* B. et S.).

C. Maritime. Range 1.

On rocks near the sea, not common.

On rocks near the Spa at Scarbro' (Black).

Upon the coast at Huntcliff, near Saltburn (Mudd).
Fruiting 11-12 mths.

3. **G. funalis** (Schwaegr.) Schpr.
(*G. spiralis*, Hook. et Tay.).
Montane A. Range 2.

Alpine rocks, rare.

Near the High Force, and on Falcon Clints, Upper Teesdale, in good fruit (Spruce 1843).

On Holwick Scar and near Winch Bridge (Barnes. 1889).
Fruiting 9-10 mths.

4. **G. torquata** Hornsch.
(*Grim. torta*, Nees.).
Montane A. Range 2-3.

Alpine rocks, rare.

Near the White Force, and on Falcon Clints, Upper Teesdale (Spruce 1843).

On Holwick Scars, and by the stream side from Maze Beck Falls eastward to High Force (Baker).

Always without fruit.

(The fruit of this Moss was unknown until it was recently found in the United States of America. It was gathered by J. B. Leiberg, on granite ledges, Lake Pend d'Oreille, Co. Idaho. Several specimens in fruit with good capsules in May, 1889).

5. **G. pulvinata** (L.) Smith.
B. Range 1-3.

On walls, roofs, and rocks.

Common, ascending from the central valley to the upper zone peaks (Baker).

Fruiting 3-4 mths.

6. *G. orbicularis* Bruch.

A. Range 1-2.

On rocks and walls, rare.

On wall near Abbey Bridge, Rokeby (Barnes).

Fruiting 2-3 mths.

7. *G. trichophylla* Grev.

Montane B. Range 1-2.

Sandstone rocks and loose stones by hedgerows, not common.

In Teesdale near Barnard Castle, and on the eastern hills near Castleton in Eskdale (Spruce.).

On rocks at Laskill in Bilsdale (Baker).

Near High Force, Teesdale, and on the east on stones in Farndale (M.B.S.).

Arncliffe Wood, Eskdale (Ingham).

Fruiting 5-6 mths.

8. *G. decipiens* (Schultz) Lindb.*(Grim. Schultzii* Brid.).

Montane B. Range 1.

Sandstone rocks, rare, or overlooked.

Near Robin Hood's Bay on the east coast (G. Masee).

Fruiting 4-5 mths.

9. *G. Donii* Smith.

Montane A. Range 3.

Rocks and walls in alpine districts, rare.

In Upper Teesdale on rocks, on the plateau of Cronkley Fell (Spruce. 1843).

Fruiting 3-4 mths.

10. **G. microcarpa** (Gmel.) Lindb.*(Rhacomitrium sudeticum* B. et S.).

Montane A. Range 3.

Moist alpine rocks, rare.

On Falcon clints, north side of the river, in Durham County, Upper Teesdale (Spruce 1843).

Fruiting 4-5 mths.

11. **G. elliptica** (Turn.) Arn.*(Rhacomitrium ellipticum* B. et S.).

Montane A. Range 2.

Damp alpine rocks, rare.

Green Fell, Upper Teesdale (Barnes).

Fruiting 11-2 mths.

12. **G. patens** (Dicks.) B. et S.

Montane A. Range 3.

Moist rocks on the higher hills.

Cronkley Scar, Upper Teesdale, rare (E. Chas. Horrell, 1889).

Fruiting 4-5 mths.

13. **G. acicularis** (L.) C. Muell.*(Rhacomitrium aciculare* Brid.).

Montane B. Range 1-3.

On stones by streams.

Frequent upon rocks and stones near streams, amongst both the eastern and western hills, ascending to the main limestone of Mickle Fell (Baker).

Fruiting 3-4 mths.

14. **G. aquatica** (Brid.) C. Muell.*(Rhacomitrium protensum* Braun M.S.S.).

Montane A. Range 2.

Dripping rocks, not uncommon.

Frequent upon dripping rocks, on most of the scars of Upper Teesdale from the Maze Beck fall eastward. In Swaledale by the river side above Keld. In Arkendale at the waterfall in Punchard's Gill (Baker).

Fruiting 3-4 mths.

15. **G. affinis** (Schleich.) Lindb.Var. β **gracilescens** (B. et S.) Lindb.*(Rhacomitrium heterostichum* Var. *gracilescens* B. et S.).

Montane A. Range 2.

Damp shaded rocks, rare.

Upon rocks near High Force, Upper Teesdale (Baker. 1856).

Fruiting 3 mth.

16. **G. heterosticha** (Hedw.) C. Muell.*(Rhacomitrium heterostichum* Brid.).

Montane B. Range 1-3.

Hard rocks and upon walls in sub-alpine districts, not rare.

Frequent upon walls amongst the hills, ascending to the main limestone of Mickle Fell (Baker).

Fruiting 4 mth.

17. **G. fascicularis** (Schrad.) C. Muell.*(Rhacomitrium fasciculare* Brid.)

Montane B. Range 1-3.

Rocks in sub-alpine districts.

Frequent on walls and rocks amongst the hills ascending to the main limestone of Mickle Fell, often on similiar sites to the previous one (Baker).

Fruiting 3 mth.

18. *G. hypnoides* (L.) Lindb.*(Rhacomitrium lanuginosum* Hedw.).

Montane B. Range 1-3.

Common upon heaths and rocks, ascending from the valley heaths to the upper zone peaks.

Strensall Common and other heaths in the vale of York, abundant.

Fruiting 5-6 mths.

19. *G. canescens* (Timm) C. Muell.*(Rhacomitrium canescens*, Brid.).

Range 1-3.

Sandy heaths. Frequent upon heaths ascending from Stockton Forest in the York vale to the upper zone peaks (Baker).

Fruiting 3 mths.

Var. β *ericoides* (Schrad.) C. Muell.

On Towthorpe Moor (Ibbotson).

Glyphomitrium Brid.1. *Gly. polyphyllum* (Dicks.) Mitt.*(Ptychomitrium polyphyllum* B. et S.).

Montane B. Range 1-2.

Rocks and old walls in sub-alpine districts, somewhat rare. In the Central Vale on stones at Thornton-le-Street. Amongst the eastern hills in Bilsdale, and on the Newton side of Roseberry Topping (Baker).

In Teesdale in Holwick Wood, and on a wall near Egglestone Abbey. In Cleveland near Roxby, Skelton, Saltburn, and Slape Wath (Barnes).

Kirkham, and Coatham Marshes, on blocks of cinder (Ingham).

Fruiting 3-4 mths.

2. **Gly. saxicola** (Web. et Mohr) Mitt.*(Campylostelium saxicola* B. et S.).

Montane B. Range 1-2.

Upon shaded sandstone rocks, amongst the eastern hills, rare. Merricks Gill near Hackness (1842), and on stones in Arncliffe Wood, Eskdale (Spruce 1847).

Near Mallyon Spout, Goathland. In Cronkley Gill, Eskdale, and near Falling Foss. Little Beck near Whitby (M.B.S.).

Also in Ox Cars Wood, Crambeck, Castle Howard In Cleveland near Guisbro', Kilton, Slape Wath, and Easington (Barnes).

Fruiting 11-12 mths.

Anaectangium Hedw.1. **A. lapponicum** Hedw.*(Zygodon lapponicus* B. et S.).

Montane A. Range 3.

Clefts of Alpine rocks, rare. (Crevices of rocks near Caldron Snout in Durham County, Upper Teesdale, in fine fruit) (Spruce. 1843).

Fruiting 6-8 mths.

2. **A. Mougeotii** (Bruch) Lindb.*(Zygodon Mougeotii* B. et S.).

Montane B. Range 1-2.

Moist shaded rocks, fruit very rare. Rocks of most of the Teesdale Scars. At White Force, and Holwick Scar (Spruce).

In the West Swale district in Whitstondale, East Stonesdale, Cliff Gill, Punchards' Gill, and at Kisdon Force, descending to Richmond (Barnes).

In Wensleydale, in the glen above Hardraw Force (Baker).

Amongst the eastern hills near Battersby (Mudd).

Near Egton Bridge, Eskdale (Spruce).

In Cleveland, on damp rocks in a gill near Slape Wath (Barnes).

Fruiting 8-9 mths.

Pleurozygodon Lindb.

1. **P. aestivus** (Hedw.) Lindb.

(*Anaectangium compactum* Schwaegr.).

Montane B. Range 1-2.

Rocks about streams on the hills, rare.

In Upper Teesdale near The High Force (Spruce).

On wet rocks near the White Force (Baker).

On the east in Hell Gill, Guisbro' Moor (Mudd).

Fruiting 8 mth.

Zygodon Hook. and Tay.

1. **Z. Stirtoni** Schimp.

Montane B. Range 1-2.

Rocks and limestone walls, rare.

On rocks by the Tees at Ovington, Aysgarth Force, Wensleydsle.

In Swaledale at Kisdon Scars, Whitfield Gill, and near Richmond, fruiting. In Cleveland at Kilton, and near Saltburn (Barnes).

Deepdale near Bowes.

Fruiting 4 mths., very rarely.

2. **Z. viridissimus** (Dicks.) Brown.

Range 1-2.

Trees, sometimes on walls, not uncommon, rare in fruit.

On trees near Crambeck, Castle Howard, in fine fruit (Spruce. 1847).

Fruiting on an elm tree on the south bank of the Tees near Gainford, and at Cotherstone. Deepdale near Bowes (Barnes).

Frequent upon trees, bushes, and sometimes on stones in the low country and also amongst the hills, generally sterile (Baker).

Var. β **rupestris** Lindb.

In Swaledale, on limestone rocks at Kisdon Scars, East Stonesdale, and near Richmond (Barnes).

Fruiting 3-4 mths.

3. **Z. conoideus** (Dicks.) Hook. and Tay.

Range 1.

Trunks of trees, rare.

On trees in Ingleby Park, Cleveland (Mudd).

Fruiting 5 mth.

Orthotrichum Hedw.

1. **O. obtusifolium** (Schrad.).

Range 1.

On tree trunks, rare.

Near York (Wilson 1856).

On an ash tree near the Abbey Bridge, Rokeby, growing amongst *Leucodon sciuroides*. Also on elm trees near Leyburn (Barnes 1892).

Not found with fruit.

2. **O. rupestre** Schleich.

Montane A. Range 2.

Rocks and walls in sub-alpine districts, rare.

On stones in the bed of the Tees below the High Force (Spruce 1843).

Fruiting 7-8 mths.

3. *O. affine* Schrad.

Range 1-2.

Upon trees in damp, shady places, sometimes on walls. Frequent in the low country, and also amongst the hills (Baker).

Var. γ *fastigiatum* (Bruch) Huebn.

Near Greta Bridge, Teesdale (Borrer 1810).

In Cullidge Wood, Castle Howard (Spruce 1847).

Near Thirsk and Laskill Bridge, Bilsdale (Baker).

On ash trees at Gainford and Richmond, also near Wensley on trees (Barnes 1893).

Var. β *rivale* Wils.

Upon an alder by the stream at Laskill Bridge, in Bilsdale (Baker 1854).

Fruiting 6-7 mths.

4. *O. speciosum* Nees.

Range 1.

On trees, rare.

Found growing upon a fir tree on Stockton Forest in the York Vale (Spruce 1843).

Fruiting 7-8 mths.

5. *O. striatum* (L.) Hedw.(*O. leiocarpum* B. et S.).

Range 1-2.

On trees, not uncommon.

Frequent upon trees in the low country, and also amongst the hills (Baker).

On trees in Stockton Forest, also near Welburn, and in Cum Hag Wood, Castle Howard, and amongst the eastern hills in Eskdale (Spruce 1842).

In Teesdale, on ash trees (Barnes 1879).

At Upleatham and Roxby in Cleveland (Barnes).

Near Helmsley (Ingham).

Fruiting 4-5 mths.

6. *O. Lyellii* Hook. and Tay.

Range 1-2.

Trunks of old trees, not very common.

Frequent upon trees, especially amongst the hills, rarely fruiting (Baker).

In fruit on tree near Welburn, Castle Howard (Spruce 1844).

Near Laskill, Bilsdale (Baker).

Trees, near Helmsley (M.B.S.).

Near Guisbro', and found with fruit near Muker, Upper Swaledale, and at Askrigg (Barnes 1890).

Near Hackness (Ingham).

A marked form, with rigid closely appressed leaves was found on trees near the Ouse at York by Spruce 1843).

Fruiting 7 mth.

7. *O. diaphanum* Schrad.

Range 1-2.

Trunks of trees, on walls and old pales.

Frequent upon trees and bushes, and occasionally on walls and rocks in the low country and amongst the hills (Baker).

On trees, near Malton and Pickering (M.B.S.).

Fruiting 4 mth.

8. *O. cupulatum* Hoffm.

Range 1-3.

Rocks and walls in limestone districts.

Frequent upon walls and stones by streams, ascending

from the central valley to the main limestone of Mickel Fell (Baker).

Abundant upon walls in Wensleydale (Barnes).

Near Bedale, and in Easgill Wood, Hawes (Wheldon).

Fruiting 4-5 mths.

Var. β . *nudum* Dicks.

On stones by stream near Rokeby, also at Gainford, and near Richmond (Barnes).

9. *O. anomalum*, Hedw. Var. *cylindricum* Schp.

(*O. saxatile* Brid).

Range 1-2.

On limestone rocks, and walls not uncommon.

Frequently ascending to the plateau of Cronkley Fell. On walls at the top of the Hambleton Hills (Baker).

Limestone walls near Malton, and very abundant and fine on stone walls on the moors near Levisham and Saltersgate (M.B.S.).

Near Bedale and Hawes (Wheldon).

Fruiting 5 mths.

10. *O. rivulare* Turn.

Range 1-2.

On stones and tree stumps by streams, not common.

On stones in the Balder near Cotherstone, Teesdale (Spruce.).

In the Central valley, plentiful along the lower part of the course of Cod Beck and near the Swale at Topcliff, also in the east in Eskdale at Castleton, and near Egton Bridge (Baker).

In Cleveland, on stones in the stream near Guisbro', Kilton, Roxby, and Saltburn, and in the Swale districts by Skeeby Beck, near Brompton on Swale (Barnes).

Fruiting 4-5 mths.

11. *O. Sprucei*, Montagne.

Range 1.

On trunks and roots of trees on river banks in the low country, not common.

Banks of the Ouse on willows at Clifton Ings near York (Spruce. 1842).

Banks of the Swale, Yore, Ouse, Wharf, Wiske, Codbeck, and Esk, often growing associated with *Tortula mutica*, Lindb. (Baker).

On the base of trees, by banks of the Derwent near Kirkham (M.B.S.).

On trees, mostly willow, by the side of Skeeby Beck near Brompton on Swale (Barnes).

Fruiting 5-6 mths.

12. *O. stramineum* Hornsch.

Range 1-2.

On trees and rocks, not common.

On trees and bushes in hedgerows both in the low country and amongst the hills (Baker).

On an ash tree near the confluence of the Lune and Tees, also on Beech trees on Welburn bank, in Castle Howard Park and on Kirkham Hill (Spruce 1843).

Near West Witton in Wensleydale (Barnes).

Near Richmond and Catterick on the Swale, and in Cleveland at Kilton, Roxby, Skelton, and Saltburn, also by the side of the Rye near Hawnby in Bilsdale (Barnes).

Fruiting 6-7 mths.

13. *O. Schimperi* Hamm.

(*O. pumilum* Dicks.).

Range 1.

On trees, rare. On ash tree at Clifton Ings near York (Spruce 1843).

At Ingleby Greenhow (Rev. J. Dalton junr.).
Near Rokeby (Barnes).
Fruiting 4 mth.

14. *O. pallens* Bruch.

Range 1.

On trees in hedgerows, rare. On willows at Clifton Ings near York, growing associated with *Orth. Sprucei* (Spruce 1842).

On the south side of the Yore near Tanfield (Baker).
Near Rokeby and Darlington (Barnes).
Fruiting 5-6 mths.

15. *O. tenellum* Bruch.

Range 1-2.

On trees in hedgerows, not common. On an ash tree on the York Road near the Castle Howard gate, also on trees in Castle Howard Park, and near the Derwent at Crambeck (Spruce 1847).

Near Muker in Swaledale, near Thirsk, Sutton under Whitstoncliffe, and near Guisbro' (Baker).

Near Richmond, and in Cleveland at Slape Wath, and Saltburn, also near Rokeby and Wensley (Barnes).

Fruiting 5-6 mths.

16. *O. pulchellum* Brunton.

Range 1-2.

Trunks of trees, sometimes on walls, rare. Most frequent in the hilly districts. In Hell Cleft, and near High Force, Upper Teesdale, also near Dalby, and on trees, chiefly elder bushes, in Mowthorpe Dale, Castle Howard (Spruce 1842).

In Cleveland, on willows and elder, in hedgerows near Loftus and Roxby. On trees near Muker, Upper Swaledale, and in Whitfield Gill, Wensleydale (Barnes).

Saltburn and Harwood Dale (Ingham 1904).

Fruiting 5-6 mths.

Weissia Ehrh. (*Ulotia Mohr*).

1. **W. americana** (P. Beauv.) Lindb.

(*Ulotia Hutchinsiae* Smith).

Montane B. Range 2.

Rocks, amongst the hills, rare. By the Greta near Rokeby (Borrer.).

On the Hambleton plateau between Scawton and Hambleton House (Spruce 1842).

On Kepwith Moor (Baker).

Fruiting 7 mth.

2. **W. Drummondii** (Hook et Grev.) Lindb.

(*Ulotia Drummondii* Brid.).

Montane B. Range 1-2.

Trunks of trees in sub-alpine districts, rare. On juniper bushes near the High Force, Upper Teesdale. Also on a tree in Lowdale Wood, Hackness, near Scarbro' (Spruce 1843).

In the west Swale district, in Whitstondale and Punchedards' Gill. In the York district, in Widdale, Whitfield Gill, and Coverdale. On the eastern hills near the head of Danby Dale (Baker).

Fruiting 7-8 mths.

3. **W. Bruchii** (Hornsch.) Lindb.

(*Ulotia Bruchii* Hornsch.).

Range 1-2.

On trees in shady woods, not uncommon. Plentiful in the Castle Howard Woods, chiefly growing on young oak trees (Spruce 1847).

Frequent upon trees, especially amongst the hills, ascending to the higher main limestone scars (Baker).

Fruiting 7-8 mths.

4. *W. ulophylla* Ehrh.

(*Ulotu crispa* Brid.).

Range 1-2.

On trees, not uncommon in sub-alpine districts. On junipers near the High Force, Upper Teesdale, and in Lowdale Wood at Hackness near Scarbro' (Spruce 1843).

Rigg Mill near Whitby (Braithwaite).

Near Helmsley (M.S.B.).

A variety with sixteen cilia was found in Callidge Wood, Castle Howard (Spruce 1847).

Var. β *intermedia* Schmpr.

In Castle Howard Woods, on trees (Spruce).

Var. γ *crispula* (Bruch) Hamm.

Near the High Force, Teesdale, growing with *Weiss. Drummondii* (Spruce 1843).

On trees in Forge Valley near Scarbro' (A. O. Black).

Near Richmond, and in Cleveland, at Kilton, and Roxby, on trees (Barnes).

Fruiting 5-6 mths.

5. *W. phyllantha* (Brid.) Lindb.

(*Ulotu phyllantha* Brid.).

Range 1.

On trees and rocks near the sea coast, also sometimes on trees inland.

On trees near Welburn, Castle Howard. Near Thornton-le-Clay, in the York Vale on trees, and at Arncliffe Wood in Eskdale (Spruce. 1847).

In Cleveland, plentiful on trees in Ingleby Park (Mudd).

On trees, mostly ash, at Brotton, Slape Wath, Upleatham and Saltburn (Barnes).

On trees in Forge Valley near Scarbro' (Black.).

Fruiting 5 mth., not found fruiting.

FAM. 11. SCHISTOSTEGACEÆ.

Schistostega Mohr.

1. **Schist. osmundacea** (Dicks.) Mohr.

Montane B. Range 2.

Caverns and damp hollows, rare.

On shale in damp hollow at Springwood. Highcliff, Guisbro' (Barnes 1887).

Fruiting 3-4 mths. In a cavern below the Wainstones Crags in Cleveland (Dalton Junr.).

FAM. 12. SPLACHNACEÆ.

Splachnum L.

1. **S. ampullaceum** L.

Montane B. Range 1-2.

On dung on wet heaths, rare.

Terrington Carr, east side near Castle Howard (Spruce 1839).

In Swaledale on Downham Moor (Ward).

In Cleveland, on boggy ground in Kildale (Mudd).

In the Vale of York, on Strensall Common on decayed cow dung (M.B.S.).

Fruiting 5-6 mths.

2. **S. vasculosum** L.

Montane A. Range 3.

Mountain heaths, very rare.

On the slope of Mickle Fell above Cronkley, Upper Teesdale (J. A. Wheldon 1883).

Fruiting 7 mth.

3. **S. pedunculatum** Huds.

Montane C. Range 1-3.

On dung of sheep or cattle on wet moorlands in sub-alpine districts.

Frequent amongst the hills ascending from Pilmoor to the peaks of Nine Standards and Mickle Fell (Baker).

Cronkley Fell, Upper Teesdale (Wheldon).

Var. β **sphaericum** Swartz.

In the Vale of York, on Strensall Common, growing on old horse dung, and amongst the eastern hills on moor near Saltersgate, and at Randymere near Egton, Eskdale (M.B.S.).

Moor below Cawthorne camps (Braithwaite).

Fruiting 5-6 mths.

Tetraplodon B. et S.1. **T. bryoides** (Zoega) Lindb.

(*T. mnioides* B. et S.).

Montane B. Range 2-3.

Growing on decaying bones, and the dung of animals in alpine districts.

In Upper Teesdale, at Cronkley and Holwick, and on the slope of Mickle Fell towards Maze Beck (Spruce 1843).

Widdy Bank Moor (M.B.S.).

Amongst the eastern hills at Kildale and Ayton Moor (Mudd).

On the plateau of Hambleton end (Baker).

Wemmergill, Lunedale (Barnes 1880).

Fruiting 5 mth.

2. **T. Wormskioldii** Lindb.

(*Splachnum Wormskioldii* Bry. Eur.).

(This rare arctic moss was first gathered in June, 1870, by M. B. Slater, on the summit of Widdy Bank Fell on

the Durham side of the Tees, and, at the time, was put in his herbarium as a large form of *Tetraplodon mniodes* B. et S., growing in peaty ditch.

During a visit to Upper Teesdale in August, 1901, Messrs. D. A. Jones and E. C. Horrell met with this rare moss again, growing in a similar ditch-like depression on the summit of the same Fell, evidently near to the same locality where it was met with in 1870. A good notice of it is given in the *Journal of Botany*, February number, 1901, page 49, with a drawing of the plant, tab. 430).

Fruiting 6-7 mths.

FAM. 14. FUNARIACEAE.

Discelium Brid.

1. **D. nudum** (Dicks.) Brid.

Montane B. Range 2.

Clay banks, rare.

On the eastern hills at Kirby Bank, Cleveland (Rev. J. Dalton, Junr.).

Whitstondale Beck, Upper Swaledale (Barnes).

Fruiting 2-3 mths.

Amblyodon P. Beauv.

1. **A. dealbatus** (Dicks.) P. Beauv.

Range 1-2.

Wet places in sub-alpine districts, rare.

On Richmond out Moor, and at Coatham Marshes in the Tees Estuary (Barnes 1892).

On Widdy Bank, Upper Teesdale, Durham County (Barnes).

Fruiting 6-7 mths.

Physcomitrella Br. et S.1. **P. patens** (Hedw.) B. et S.*(Phascum patens* Hedw.).

Range 1.

Damp clay fields, and on the mud of dried up pools, rare.

In the central vale, in ditches, in a fir plantation, on Stockton Forest, near York, and near Temple Rush, Castle Howard (Spruce 1847).

Banks of the Derwent, near Malton (Slater and Stabler. 1898).

Fruiting 9 mth.

Physcomitrium Brid.1. **P. pyriforme** (L.) Brid.

Range 1-2.

Moist banks and borders of ditches, not uncommon.

Near WigganThorpe (Ibbotson).

On Clifton Ings, near York, at Ganthorpe, Castle Howard, and on Kirkham Hill (Spruce. 1842).

Coneysthorpe Bank Wood, and by sides of ditches near Castle Howard railway station (M.B.S.).

Skelton and Kilton in Cleveland (Barnes).

Fruiting 4 mth.

Funaria Schreb.1. **F. obtusa** (Dicks.) Lindb.*(Entosthodon ericetorum* C. Muell.).

Range 1-2.

On wet heaths and banks of sandy clay, not uncommon.

On Slingsby Moor, Terrington Carr, and in Upper Teesdale (Spruce. 1843).

Amongst the eastern hills at Saltersgate and Goathland, frequent (M.B.S.).

Fruiting 3-4 mths.

2. **F. fascicularis** (Dicks.) Schpr.

(*Physcomitrium fasciculare* B. et S.).

Range 1-2.

In fields and wooded banks, rare. In the Central Vale on Stockton Forest near York (Spruce 1844).

In Crambe Wood near Kirkham Abbey railway station (M.B.S. 1882).

Fruiting 4-5 mths.

3. **F. attenuata** (Dicks.) Lindb.

(*Entosthodon Templetoni* Schwgr.).

Montane B. Range 2.

On shaded banks and wet sandstone rocks, rare.

On the eastern hills, at the bridge over Brocka Beck, on the high road between Whitby and Scarbro' (Baker).

In Upper Teesdale, in the crevices of rocks below Falcon Clints in Durham (Slater and Anderson. 1853).

Fruiting 6-7 mths.

4. **F. hygrometrica** (L.) Sibth.

Range 1-2.

On the ground on heaths and banks, common, especially on burnt or carbonaceous soil.

Crambeck lime kilns (Spruce).

Growing in large patches on the ruins of Duncombe Park Mansion, Helmsley, after the destructive fire (M.B.S. 1881).

Fruiting 5-8 mths.

FAM. 15. BRYACEÆ.

Oreas Brid.1. **O. Mielichoferi** (Funck) Brid.*(Mielichoferia nitida* Hornsch.).Var. β **compacta** Hornsch.

Montane B. Range 2.

Dripping rocks, very rare.

On dripping liassic rocks above Ingleby Greenhow, in Cleveland at an elevation of about 1000 feet (Mudd).

Not recorded from any other site in Yorkshire, and only known from two other British localities in the Highlands of Scotland (Braithwaite).

Fruiting 8-9 mths.

Leptobryum Wilson.1. **L. pyriforme** (L.) Wils.

Range 1.

On shaded rocks and walls, and in sandy soil. Often growing on the surface soil of pots amongst cultivated greenhouse plants, and in gardens.

In the Central Vale on walls, and in sandy ground at Hutton Conyers, Kilvington, Thirsk, Heworth, Haxby, &c. (Baker).

Near Northallerton (Wheldon).

Abundant on an old sandstone water trough at Malton (M.B.S.).

Coatham Marshes, fruiting freely (Barnes).

Fruiting 5-6 mths.

Var. **minus** Limpr.

Coatham Marshes (Ingham).

Pohlia Hedw.1. **P. acuminata** Hornsch.*(Webera acuminata* Schpr.).

Montane B. Range 2.

Banks and stony places on the higher hills, rare.

Sparingly on rocks at the west end of Holwick Scar, in Upper Teesdale (Spruce. 1843).

Fruiting 8 mth.

2. **P. polymorpha** Hornsch.*(Webera polymorpha* Schpr.).

Montane A. Range 3.

On rocks and turf in mountains, rare.

Upon the main limestone rocks of the Mickle Fell range, Upper Teesdale (Baker. 1856).

Fruiting 7-8 mths.

3. **P. elongata** Hedw.*(Webera elongata* Schpr.).

Montane A. Range 2.

Rocks and gravelly banks in sub-alpine places, rare.

In Wensleydale, on the limestone crags of Addleborough (Ward).

In clefts of rocks near Caldron Snout on the Yorkshire side of Maize Beck, Upper Teesdale (Barnes 1880).

Fruiting 8 mth.

4. **P. cruda** (L.) Lindb.*(Webera cruda* Schwgr.).

Montane B. Range 1-2.

Clefts of rocks and sandy banks amongst the hills.

In Upper Teesdale, plentiful upon most of the cliffs. Ettersgill Beck, Hell Cleft, Cronkley Fell, and near High Force (Spruce).

Near Middleton (Baker).

Near Gainford and Richmond (Barnes).

In the west Swale district near the river above Hoggarth's smelting mill near Keld (Baker).

In the Yore district, at Mossdale Head (Brunton).

In Cleveland, on the summit of Cold Moor at the head of Bilsdale (Dalton, Junr.).

On Seamer Moor, near Scarbro' (G. Masee).

Deepdale, near Bowes (Barnes).

Fruiting 7-8 mths.

5. **P. nutans** (Schreb.) Lindb.

(*Webera nutans* Hedw.).

Range 1-3.

Sandy and turfy heaths, very abundant, ascending from the central vale to the upper zone peaks (Baker).

A variety with the inner peristome rudimentary was gathered on Stockton Forest, near York, by Spruce. 1841.

Fruiting 5-6 mths.

Var. β **longiseta** B. et S.

(Leckby Carr. Ingham. N. W. York).

6. **P. carnea** (L.) Lindb.

(*Webera carnea* Schpr.).

Range 1-2.

Clay fields, and sides of ditches, &c.

Frequent upon stream sides and clay banks in the low country and amongst the hills (Baker).

Near York and Kirkham Hill (Spruce.).

On ditch sides near Old Malton (M.B.S.).

Gutter side at Ruswarp, near Whitby (Anderson).

Goathland Beck (Braithwaite).

Fruiting 4 mth.

7. *P. annotina* (L.) Lindb.*(Webera annotina* Schpr.).

Range 1-2.

Sandstone cuttings and shaded banks.

In the central vale, in wet sandy lane on Stockton Forest, and near High Force, Upper Teesdale (Spruce 1843).

Terrington Carr, and in Sandstone quarry, Castle Howard Park (M.B.S.).

Whitstondale in Upper Swaledale, and at Slape Wath and Saltburn in Cleveland (Barnes).

Fruiting 5-6 mths.

8. *P. Ludwigii* (Spreng.) Lindb.*(Webera Ludwigii* Schpr.).

Montane A. Range 3.

Peaty soil on alpine rocks, rare.

Near the White Force, Cronkley Fell, Upper Teesdale (Spruce 1843).

Fruiting 8-9 mths.

9. *P. albicans* (Wahl.) Lindb.*(Webera albicans* Schpr.).

Montane B. Range 1-3.

On clay banks and by streams amongst the hills.

Frequent in damp places, especially on dripping rocks amongst the hills ascending from the Central Vale to the main limestone of Mickle Fell (Baker).

Amongst the eastern hills at Saltersgate Beck (Anderson).

In Goathland Beck, and in Arncliffe Wood, Eskdale, and other tributary streams of the Esk near Whitby (M.B.S.).
Strensall Common (Ingham).

Fruiting 5-6 mths.

Plagiobryum Lindb.2. **Plagiobryum Zierii** (Dicks.) Lindb.*(Bryum Zierii* Dicks.).

Montane B. Range 2-3.

Crevices of rocks amongst the hills, not common.

Holwick Scar and near Winch Bridge, Upper Teesdale (Spruce 1843).

Frequent upon most of the Teesdale Scars ascending to the main limestone of Mickle Fell.

In Arkendale at Punchars Gill. In the Yore district in Widdale, Mossdale, Waldendale, Coverdale, and on the scars of Addleburg (Baker).

On the east, found on Ingleby Bank (Mudd).

Cliff Gill and Keld Upper Swaledale (Barnes).

Near Kilburn (Ingham).

Fruiting 10-11 mths.

Bryum Dill.1. **B. filiforme** Dicks.*(B. julaceum* H. et T.).

Montane A. Range 2-3.

Wet places among rocks in alpine districts, rare.

Near Caldron Snout (Spruce 1843).

In Upper Teesdale, upon the main limestone of Mickle Fell, and on the scars of Blea Beck and Crosswaite Beck (Baker).

Below High Force (M.B.S. 1853).

Fruiting 8-9 mths.

2. **B. concinnatum** Spruce.

Montane A. Range 2.

Dripping sub-alpine rocks, rare.

Near Caldron Snout, and on rocks near Winch Bridge, Upper Teesdale (Spruce. 1843).

On Holwick Fell, and near High Force, also in Upper Swaledale at Kisdon Force, East Gill, Whitfield Gill, and at Aysgarth Force and Deepdale (Barnes. 1889).

Fruit unknown.

3. **B. lacustre** (Bland.) Brid.

Range 1-2.

Wet sandy places, rare.

Lockwood Beck reservoir, Deepdale. Coatham Marshes, also growing in abundance on the Durham portion of the Tees estuary at Seaton Snook. On Holwick Fell, Upper Teesdale (Barnes 1891).

Fruiting 6-8 mths.

4. **B. inclinatum** (Sw.) Bland.

Range 1-3.

On walls and banks, not uncommon.

In Upper Teesdale near Winch Bridge and the High Force—in the Central Vale of York and on Stockton Forest. Near new river bridge, Castle Howard, and on walls at Ganthorpe (Spruce 1843).

On Kirkham Hill (M.B.S. 1848).

Frequent upon walls and banks ascending from the Central Valley to the main limestone cliffs of Mickle Fell (Baker).

Fruiting 5 mths.

5. **B. pendulum** (Hornsch.) Schrp.

(*B. cernuum* B. et S.).

Range 1-2.

On walls and rocks and waste ground, frequent.

Near Greta Bridge (Borrer 1810).

In Teesdale, on walls by the road side from Barnard Castle to the High Force. Near York and also near the Temple, Castle Howard (Spruce).

Upon walls in many places especially amongst the hills, Middleham, Tanfield, Osmotherby, &c. (Baker).

On walls about Malton (M.B.S.).

Slape Wath, Saltburn, and Coatham Marshes (Barnes).

Fruiting 5 mths.

6. *B. Warneum* Blandow.

Range 1.

Sandy or muddy ground by the sea or streams, rare.

On the Yorkshire side of the Tees estuary at Coatham Marshes, also on the Durham side at Seaton Snook, and on sea banks, Saltburn (Barnes 1891).

Fruiting 8-9 mths.

7. *B. cernuum* (Sw.) Lindb.

(*Bry. uliginosum*, B. et S.).

Range 1.

Boggy ground, sandy banks and by streams, not common.

Near York, near mouth of Scalby Beck near Scarbro', and under new river bridge, Castle Howard (Spruce 1842).

Coast cliffs between Whitby and Sandsend (Ibbotson 1843).

In land by the Yore side, west of Tanfield, and in a swamp in the lower part of Newton Dale (Baker).

Strensall Common (Ingham)

By the Tees south of Gainford; near Hawnby in Bilsdale, and on sea banks near Saltburn, also on Holwick Fell, Teesdale (Barnes).

Fruiting 8 mths.

8. *B. Marratii*, Wilson.

Range 1.

Wet sandy places by the sea, rare.

Found in Coatham Marshes, south side of the Tees estuary (Barnes 1891).

Fruiting 9 mth.

9. *B. calophyllum* R. Br.

Range 1.

Wet sandy ground, rare.

In Coatham Marshes with the previous one, and at Lockwood Beck reservoir; also at the Durham side of the Tees estuary at Seaton Snook (Barnes 1891).

Fruiting 9-10 mths.

10. *B. intermedium* Brid.

Range 1-2.

Walls and shaded ground, not uncommon.

Sandy Hill Bridge, Castle Howard Park, and Kirkham Hill (Spruce 1842).

Frequent on mud-capped walls and in loamy ground, in the low country and amongst the hills (Baker).

Fruiting 6-9 mths.

11. *B. bimum* Schreb.

Range 1.

Boggy and marshy ground, rare.

Yowlas Glen near Helmsley (Baker 1854).

Coatham Marshes (Barnes).

Strensall Common (Ingham).

Fruiting 6-7 mths.

12. *B. affine* Bruch Lindb.

Range 1-2.

Walls and damp rocks, not common.

On Stockton Forest near York, also on walls at Egglestone in Teesdale (Spruce 1843).

Ettersgill Beck, Teesdale, and in Swinner Gill, Upper Swaledale (Barnes 1891).

Fruiting 6-7 mths.

13. *B. torquescens* Br. et S.

Range 1-2.

On walls and rocks, rare.

Near Gormire on a rock on the east side of the lake (Borrer 1844).

Found in the same locality (Baker 1854).

Fruiting 6-7 mths.

14. *B. pallescens* Schleich.

Montane A. Range 1-2.

Rocks and walls in sub-alpine districts, rare.

On rocks as well as on sandy deposits by the Tees below Winch Bridge, also in Hell Cleft, sparingly (Spruce 1843).

On the slope of Mickle Fell towards Maize Beck. In Swaledale by the Riverside above Keld, and near the Yore on the magnesian limestone rocks at Tanfield (Baker 1853).

Var. β *contextum* Hornsch.

Ettersgill Beck, Teesdale (Spruce. 1843).

Fruiting 7-8 mths.

15. *B. caespiticium* L.

Range 1-2.

On walls, rocks, and dry banks, frequent.

At Cronkley in Teesdale, also near York, Kirkham Hill, Coneysthorpe, Castle Howard, &c. (Spruce).

Common upon banks and walls both in the low country and amongst the hills (Baker).

On walls at Holwick, Upper Teesdale (Barnes).

Var. γ *badium* Brid.

Arncliffe Wood, Eskdale, N. Yorkshire (Ingham. 1897).

Fruiting 5-6 mths.

16. *B. argenteum* L.

Range 1-3.

On waste ground, walls and rocks, frequent.

Near York, Kirkham Hill, Ganthorpe, Castle Howard, &c. (Spruce 1841).

Common upon old thatched roofs, and walls ascending from the Central Vale to the limestone pavement of Cam-fell (Baker).

Fruiting 10-11 mths.

Var. γ *lanatum* (P. Beauv.).

Near Holwick, Upper Teesdale (Barnes).

17. *B. bicolor* Dicks.

(*Bry. atro-purpureum* W. et M.).

Range 1-2.

On banks, roadsides, and walls, not rare.

Near York, Kirkham Hill, and Castle Howard (Spruce 1844).

Frequent upon walls and banks from the Central Vale, to the plateau of Holwick Fell, often associated with *B. argenteum* (Baker)

Var. β *gracilentum* Tay. M.S.S.

Near Ganthorpe, Castle Howard (Spruce.).

Fruiting 5 mth.

18. *B. erythrocarpon* Schwaegr.

(*B. sanguineum* Brid.).

Range 1.

Gravelly and sandy heaths.

In the Central Valley on Stockton Forest near York, and in Cumm Hagg wood, Castle Howard (Spruce 1843).

On Strensall Common, abundant (Stabler and Slater 1883).

Fruiting 6-7 mth.

B. Mildei Juratz.

Montane A. Range 2.

Wet rocks by waterfalls, rare.

On Holwick Scar, and Maize Beck, Upper Teesdale. Sterile (Spruce 1843).

Fruiting 7-8 mths. very rarely.

20. **B. alpinum** Huds.

Montane B. Range 1-2.

Moist sub-alpine rocks, not uncommon.

On Falcon Clints, Cronkley and near High Force, Teesdale (Spruce 1843).

Frequent upon dripping rocks in Teesdale from the Falls of Maize Beck eastward to Lonton. In Yoredale, at the waterfall in Skell Gill near Askrigg (Baker).

Var. β **meridionale** (Schpr.).

On rocks by the sea, at the base of Peak Cliff near Robin Hood's Bay (M.B.S. 1888).

At Kisdon Force, Upper Swaledale (Barnes).

Fruiting 6-7 mths. very rarely.

21. **B. pallens** Swartz.

Montane B. Range 1-3.

On rocks and stones by streams, and on wet ground.

On Strensall Common and Stockton Forest near York. At Welburn and Crambeck in the Castle Howard district, also in Upper Tees near Winch Bridge and Ettersgill Beck (Spruce. 1843).

Frequent in damp places amongst the hills from the central valley to the peaks of the upper zone (Baker).

Amongst the eastern hills at Saltersgate Beck, and by the streams at Goathland (M.B.S.).

Fruiting 6 mth.

22. **B. ventricosum**, Dicks.

(*Bry. pseudo triquetrum* Schwgr.).

Montane B. Range 1-3.

Moorland bogs and on wet rocks by streams, not uncommon. On Slingsby Moor and Terrington Carr, Castle Howard (Spruce 1837).

Frequent upon wet heaths ascending from Stockton Forest and Pilmoor, to the upper zone peaks (Baker).

Fruiting 6-7 mths.

23. **B. neodamense** Itzigs.

Montane A. Range 2.

On wet rocks by streams, rare.

Maize Beck, Upper Teesdale, sterile (Spruce 1843).

Fruiting 7 mth. very rarely.

24. **B. capillare** L.

Range 1-3.

On the ground, walls, trunks of trees, and old thatch, frequent.

Common upon banks and rocks, from the central valley upwards to the main limestone of Cam Fell and Mickle Fell (Baker).

Var. ζ **obconicum** Hornsch.

Near Greta Bridge (Borrow 1810).

On walls between Barnard Castle and Lartington, Teesdale, also in the sandstone quarry Castle Howard Park (Spruce 1843). On wall, Cum Hagg, by road side to Terrington, Castle Howard (M.B.S.).

In the central valley, on hedge banks by the side of the Great North Road, opposite South Kilvington (Baker).

Rainton Heights near Hawnby, Bilsdale (Davies).

Walls near Wensley (Barnes).

Fruiting 4-6 mths.

25. **B. proliferum** (L.) Sibth.

(*B. roseum* Schreb.).

Montane B. Range 1-2.

Shaded places in woods by streams.

Stöckton Forest, near York; also in Gilla Leys, Castle Howard (Spruce 1841).

On damp rocks in woods amongst the hills (Baker).

Rigg Mill Beck near Whitby (Braithwaite).

Saltergate Beck (M.B.S. 1853).

Kisdon Force, Upper Swaledale, near High Force, Teesdale, and at Hawnby in Bilsdale (Barnes).

Fruiting 10 mth. very rarely.

FAM. 16. BARTRAMIACEÆ.

Bartramia Hedw.

1. **B. Oederi** (Gunn.) Sw.

Montane B. Range 2.

On wet, calcareous rocks on mountains.

In Upper Teesdale, on rocks at the White Force, Cronkley Scar, and on rocks below High Force (Spruce 1843).

In Swaledale, at Kisdon Force, and in Cliff Gill and Hell Gill. In the Yore District, in Mossdale and Cotterdale, and plentiful about the highest waterfall in Coverdale (Baker).

On the east, found on rocks near Battersby, Cleveland (Mudd).

Deepdale, near Bowes (Barnes).

Fruiting 6-7 mths.

2. *B. pomiformis* (L.) Hedw.

Montane B. Range 1-3.

Stony banks and clefts of rock, not uncommon.

Rocky places near the High Force, Teesdale; also on shaded bank near Welburn, Castle Howard (Spruce 1843).

Frequent upon shaded banks and rocks amongst both ranges of hills, ascending to the main limestone of Mickel Fell. In the central valley at Tang Hall, near York (Baker).

Near Saltersgate Beck (M.B.S.).

Var. β *crispa* (Sw.).

Blea Beck, Teesdale (Baker).

Near High Force, Teesdale; very fine by Whitstondale Beck, and on scars opposite the smelting mill, Keld, Upper Swaledale (Barnes).

Cronkley Scar, Teesdale (Wheldon).

Fruiting 5-6 mths.

3. *B. Norvegica* (Gunn.) Lindb.

(*B. Halleriana* Hedw.).

Montane B. Range 2.

Damp rocks on mountains, rare.

In the clefts of basaltic rocks near the High Force, Upper Teesdale, with fruit in good state (Spruce).

On the east on Ingleby bank, Cleveland (Mudd).

Fruiting 7 mth.

4. *B. ithyphylla* Brid.

Montane B. Range 2-3.

On the ground and clefts of rocks amongst the hills. Frequent on basaltic rocks, especially on Cronkley and Holwick Scars, Upper Teesdale (Spruce 1843).

Upon most of the Teesdale Scars, ascending from the High Force to the main limestone of Mickel Fell (Baker).

In Swaledale, near Marske (Ward).

In the Yore district at Mossdale Head (Brunton).

On the east on walls at Yearsly Moor (Ibbotson 1842).

Rare in Cleveland, on sandstone rock and on shale near Guisbro', also near Rokeby and Deepdale, near Bowes (Barnes).

Fruiting 6 mth.

Philonotis Brid.

1. **P. fontana** (L.) Brid.

Montane B. Range 1-3.

Near springs and gravelly moorland bogs.

Frequent upon damp moors, and in the neighbourhood of springs and streams, ascending from the vale heaths to the upper zone peaks (Baker).

Scackleton Moor, near Castle Howard (Spruce 1839).

Fruiting 6-7 mths.

A very variable moss, several varieties are noted by Braithwaite, of which some may be met with in N. Y.

2. **P. calcarea** Schimp.

Montane B. Range 1-2.

Moorland bogs in limestone districts.

Plentiful in Upper Teesdale, where it was first detected for Britain by R. Spruce, 1843, and published in his *Musci and Hepaticæ of Teesdale* (Trans. of Botanical Society of Edinbro', vol. ii. 1844).

Frequent about springs and streams, amongst both ranges of hills, especially in the calcareous dales (Baker).

Saltersgate Beck (Anderson).

Troutsdale, near Hackness, and Beckdale, Helmsley (M.B.S.).

Fruiting 7 mth.

Breutelia Schpr.1. **B. chrysocoma** (Dicks.) Lindb.*(Bartramia arcuata* Swartz.).

Montane B. Range 1-3.

Wet heaths and rocks in sub-alpine moorland and by waterfalls.

Hedge bank near Terrington Moor, Castle Howard.

On Stockton Forest near York, and in Upper Teesdale, abundant (Spruce. 1843).

Frequent upon rocks and heaths, amongst the hills ascending from the vale heaths to the upper zone peaks (Baker).

Fruiting 6 mth. very rarely.

Catocopium Brid.1. **C. nigratum** (Hedw.) Brid.

Montane A. Range 2-3.

Wet mountains, rocks, and marshy heaths, rare.

Reported from near Wheysyke House, Upper Teesdale, by R. Bowman, 1830.

Widdy Bank, Teesdale (Borrer and Nowell).

Near Caldron Snout (Slater and Anderson 1853).

The earlier localities of this rare moss are on the north side of the Tees in the county of Durham.

Fruiting 7-8 mths.

In August, 1901, this rare Upper Teesdale moss was gathered on the south side of the Tees in Cronkley pastures by D. A. Jones, F.L.S., and E. C. Howell, F.L.S.

This includes it in the limits of North Yorkshire (M.B.S.).

FAM. 17. MEESEACEÆ.

Paludella Ehrh.1. *P. squarrosa* (L.) Brid.

Montane B. Range 1.

Deep peat bogs, very rare.

Found in Terrington North Car, near Castle Howard, by H. Ibbotson, 1842. Growing there in fair abundance in 1853 (M.B.S.).

After the wet summer of 1860, a deep drain was cut through the centre of the peaty bog. In July, 1868, the bog was visited by Messrs Slater and Stabler in search of this moss. It had then almost disappeared, by careful searching, they succeeded in observing a few stems of the plant. It has not been seen since, and must now be considered extinct as a British Moss until found in some other locality. The only other known British locality for this rare plant was Knutsford Moor, Cheshire, where it was found by W. Wilson in 1832. Draining operations on this locality have long since destroyed the plant.

Not found fruiting in Britain.

Meesea Hedw.1. *Meesea trichodes* (L.) Spruce.*(Meesea uliginosa* Hedw.).

Montane A. Range 2-3.

Near wet springs on boggy moorlands, rare.

Sparingly on moist basaltic rocks near Winch Bridge, Teesdale (Spruce 1843).

On moor near Richmond Beacon (Ward).

On Widdy Bank, Upper Teesdale, growing with *Catoscopium nigratum* (Beesley and Slater; 1903).

Fruiting 6-7 mths.

FAM. 18. MNIACEÆ.

Gymnocybe Fries (*Aulacomnium* Schwgr.).1. **G. palustre** (L.). Fries.

B. Range 1-3.

Moorland bogs, common on the hills.

Terrington Car, Castle Howard (Spruce 1839).

Frequent in swampy places, ascending from the Cars and Heaths of the Central Vale to the Upper Zone Peaks (Baker).

Saltergate Beck, abundant (Anderson).

Fruiting plentifully on Pilmoor (Barnes).

Fruiting 6 mth.

Orthopyxis P. Beauv.1. **O. androgyna** (L.) P. Beauv.

(*Aulacomnium androgynum* Schwgr.).

B. Range 1-2.

On stones in woods, and shaded banks, not common.

On rocks near the High Force, Teesdale, also in the the sandstone quarry Castle Howard Park (Spruce).

Tanfield (R. B. Bowman).

In the central valley, on tree stumps in Leckby Car (Baker).

In Cleveland near Ayton (Mudd).

Plentiful at the Wainstones (Dalton Jun.).

Near Keld, Upper Swaledale, and at Holwick, Teesdale (Barnes).

Fruiting 6 mth. very rarely.

Mnium Dil. L.1. **M. marginatum** (Dicks.) P. Beauv.*(M. serratum* Schrad.).

Montane B. Range 1-3.

Among rocks and stony ground in woods, not uncommon.

Frequent on shaded rocks amongst both ranges of hills from Cock Mill Woods near Whitby, to the main limestone cliffs of Widdale Fell (Baker).

Raywood, Castle Howard (Spruce).

Arncliffe Wood, Eskdale (M.B.S.).

Aysgarth Force (Barnes).

Fruiting 4 mth.

2. **M. riparium** Mitten.

Montane B. Range 1.

On stumps by shaded streams and in woods, rare.

Mowthorpe Dale Wood, Castle Howard (Spruce, 1844).

Fruiting 5 mth.

3. **M. hornum** (L.).

Range 1-3.

Damp shaded banks, and in woods, common.

Everywhere frequent in shaded places, ascending from the central valley to the upper zone peaks (Baker).

Fruiting 5-6 mths.

4. **M. silvaticum** Lindb.*(M. cuspidatum* Hedw.).

Montane B. Range 1-2.

Wet shady places in woods, on rocks and tree roots.

Wass Bank (Ibbotson, 1842).

Deepdale and Rokeby Park, Teesdale. Kisdon Scars in

Upper Swaledale, and on the Western slopes of Hambleton Hills (Baker).

Near Winstone Bridge, Teesdale, also near Richmond, Swaledale (Barnes).

Fruiting 4-5 mths.

5. *M. Seligeri* Juratz.

(*M. affine* β . *elatum* B. et S.).

B. Range 1-2.

Wet heaths and about springs, rare.

Hell Kettles near Croft (Baker, 1856).

Terrington Car, Castle Howard, and in Saltersgate Beck, fruiting (M.B.S.).

Coatham Marshes (Barnes).

Newby Carr (Wheldon, 1892.).

Fruiting 5-6 mths., rarely.

6. *M. cuspidatum* (L.) Neck.

(*M. affine* Bland.).

Range 1-3.

On the ground in wet boggy places, not common.

By the Greta near Rokeby (M.B.S.).

Mickle Fell, Teesdale, also on Hawnby Car, and near Croft (Barnes).

Clifton Ings, York (Ingham).

Fruiting 5 mth., rarely.

7. *M. undulatum* L.

Range 1-3.

Damp shady woods and hedge banks, common.

Ascending from the central valley to the main limestone of Camfell and Mickle Fell (Baker).

Gilla Leys, Castle Howard, fruiting (Spruce, 1841).

Cockmill Beck near Whitby, *c.f.* (Braithwaite).

Lyons Quarry near Malton, fruiting (M.B.S. 1849).
Fruiting 4-5 mths., seldom fruiting.

8. *M. rostratum* Schrad.

Range 1-3.

Shaded banks and rocks by streams, not uncommon.

Gilla Leys and Cum Hagg Wood, Castle Howard (Spruce, 1842).

Ascending from the central valley to the limestone pavement of Cam Fell (Baker).

Goathland Beck (M.B.S.).

Near Waterfall, Liverton Beck and Saltburn, Cleveland, and south side of the Tees near Gainford (Barnes).

Fruiting 4 mth.

9. *M. stellare* Reich.

Montane B. Range 1-2.

Damp shaded banks in woods, not common.

Gilla Leys and Mowthorpe Dale Wood, Castle Howard (Spruce, 1844).

Near High Force, Upper Teesdale (Slater and Anderson, 1853).

Beckhole, Goathland (Braithwaite).

Amongst the eastern hills, Baysdale, Goathland Dale, Flazendale, and Bilsdale (Baker),

Near Richmond, Swaledale, and near Easington, Kilton and Saltburn, in Cleveland (Barnes).

Fruiting 6 mth., very rarely.

10. *M. pseudo-punctatum*, Br. et Sch.

(*M. subglobosum* B. et S.).

Montane B. Range 1-2.

Marshy moorland heaths, not common.

In swampy places amongst both ranges of hills, Lunedale

Tarn, Widdale, Codhill Bog, Kirby Bank, Goathland Dale, Gurtoff Gill, Brandsdale, Danby Dale, &c. (Baker).

Holwick Fell and Green Fell, Teesdale. Lockwood Beck, and Aysdale Gate, in Cleveland (Barnes).

Fruiting 3 mth.

11. *M. punctatum* L.

Range 1-3.

Wet rocks and sandy districts of rivulets, common.

Frequent by stream sides and on damp rocks, ascending from the central vale to the main limestone of Mickle Fell (Baker).

Var. β . *elatum* Schpr.

Blueberry Gill, Goathland (M.B.S. 1870).

Fruiting 2-3 mths.

Cinclidium Swartz.

1. *C. stygium* Swartz.

- Montane A. Range 2-3.

Spongy moorland bogs, rare.

Widdy Bank Fell in Durham, and Holwick Fell on the Yorkshire side of the river, Upper Teesdale (Barnes, 1880).

Fruiting 6-7 mths.

PLEUROCARPOUS MOSSES.

FAM. 19. HYPNACEÆ.

(Subfam. I. LESKEEÆ).

Thuidium Br. et Schp.1. **T. tamariscifolium** (Neck.) Lindb.*(Hypnum tamariscinum Hedw.)*

Range 1-3.

Common in shady, damp woods and banks, ascending from the central valley to the upper zone peaks; rarely found fruiting (Baker).

Mowthorpe Dale and Terrington North Car, in fruit (Spruce 1842).

Gilla Leys; Castle Howard, fruiting; Saltergate Beck, fruiting (M.B.S., 1853).

Dry Gill, Teesdale, and near Easington Beck, Cleveland; fruiting (Barnes).

Fruiting 10-11 mths., rarely.

2. **T. recognitum** (Hedw.) Lindb.*(Hypnum recognitum Hedw.)*

Xerophilous. Range 1-2.

Woods and grassy banks in calcareous districts; not uncommon in the calcareous districts about Castle Howard and Malton, always sterile; calcareous pastures near Welburn; Hildenley stone quarry (Spruce 1848).

Dry, grassy banks near Hovingham (M.B.S.).

Fruit very rare, 7-8 mths.

3. **T. Blandovii** (Web. et Mohr) Schpr.
(*Hypnum Blandovii* Schpr.).

Range 1.

Wet moorland bogs, rare.

Terrington North Car, Castle Howard (Spruce, 1842).

(*Now extinct from drainage of the Car*).

In the central valley, plentiful at Halnaby Car (Baker).

Gathered at Halnaby, 1887 (R. Barnes).

Fruiting 5 mths., rarely.

Leskea Hedw.

1. **L. polycarpa** Ehrh.

Range 1.

About tree roots in damp places, by streams. Plentiful in the low country (Baker).

Near York, and by the Derwent at Kirkham (Spruce, 1846).

Not uncommon near the base of trees by the banks of the Derwent, near Malton (M.B.S.).

Near Saltburn (Barnes).

Arncliffe Wood, Eskdale (Ingham).

Fruiting 5-6 mths.

Anomodon Hook. et Taylor.

1. **A. viticulosus** (L.) Hook. and Tay.

Montane C. Subxerophilous Range 1-2.

Stony ground in calcareous districts, by shady walls and trunks of trees.

Frequent upon limestone rocks amongst the hills, on both sides of the central valley (Baker).

Not common in fruit.

Oxcars Wood, and in Mowthorpe Dale, Castle Howard, in fine fruit (Spruce, 1848).

Woodlands, Sleights, *c. fr.* (Braithwaite).

Abbey Bridge, Rokeby, Teesdale, and near Malton (M. B. S.).

Mill Gill near Hawnby, fruiting (Wheldon).

Mill Gill, Wensleydale, and near Winston, Teesdale, fruiting (Barnes).

Fruiting, rarely 3-4 mths.

2. **A. longifolius** (Schleich.) Hartm.

Range 1-2.

Stony ground and at the roots of trees, rare and sterile.

On rocks by the side of the Tees near Egglestone Abbey, where the main limestone issues from beneath the millstone grit (Baker, 1856).

On the Durham side of the Tees at Winston Bridge, also in Swaledale at Keld and near Richmond, also near Askrigg, Wensleydale (Barnes, 1889).

Fruiting 11-3 mths., very rarely.

(Subfam. 2. HYPNÆ)

Amblystegium Br. et Schp. (Hypnum Dill.).

(Sec. 1.—EU. AMBLYSTEGIUM Lindb.).

1. **A. filicinum** (L.) De Not.

Range 1-2.

Wet banks and about springs, especially on limestone. Common on damp places, ascending from the central valley to the plateau of Pin Seat (Baker).

Terrington Car, and about Castle Howard (Spruce, 1847).

Fruiting 4-5 mths.

Var. β . **trichodes** Brid.

Langdon Beck, Upper Teesdale (R. Barnes. 1886).

2. *A. fallax* (Brid.) Milde.

(*Hypnum filicinum* β . *vallis-clausae* (Wils. B.B.).

Range 1-2.

In streams and near springs, not common.

Crambeck, Castle Howard (Spruce, 1844).

Plentiful in the streams in Yowlasdale and Flazendale (Baker).

In pools below Cronkley, Teesdale (Barnes, 1880).

Near Helmsley (Ingham).

Fruiting 4-5 mths.

3. *A. irriguum* (Wils.) Schpr

Range 1.

Sandstone rock and stones in streams.

On stones by the Derwent, near the weir at Kirkham (Spruce, 1847).

Stones by the Swale at Aisenby, and by the Yore at Tanfield (Baker).

On stones in Easington Beck and Roxby Beck in Cleveland (Barnes).

At Cotherstone, Teesdale (Barnes 1897).

Fruiting 5 mth.

4. *A. fluviatile* (Swartz) Schpr.

Range 1-2.

Rocks and stones in sub-alpine streams.

Lowdy Hill Gill, Castle Howard (Spruce, 1848).

In the Tees at Croft and Dalton, the Swale at Topcliff, and the Yore at Aysgarth Force and Tanfield (Baker).

Whitstonedale Beck, Swaledale, and in the Tees at Winston (Barnes).

Fruiting 5-6 mths.

5. *A. varium* (Hedw.) Lindb.

Range 1.

Wet ground, about tree roots or decayed sticks, not common.

Near York (Spruce, 1842).

Marske Mill, Saltburn (Barnes).

Fruiting 4 mth.

6. *A. serpens* (L.) Br. Schp.(*Hypnum serpens* L.).

Range 1-2.

Damp shady banks, stones and tree trunks, common.

In shady places in the low country and amongst the hills (Baker).

Fruiting 4-5 mths.

Var. β . *tenuë*, Schp.

Near Winston Bridge, Teesdale, also near Richmond (Barnes, 1890).

7. *A. Juratzkæ* Schpr.

Range 1.

On stones and tree stumps in wet places, rare, or overlooked as a large form of preceding species.

Callidge Wood and Gilla Leys, Castle Howard (M.B.S., 1847).

By Bedale Beck, also by the Swale above Richmond (Wheldon, 1897).

Lastingham (Ingham).

Fruiting 4-5 mths.

8. *A. radicale* (P. Beauv.) Mitt.

Range 1.

On rotten sticks and humus in wet shady places, rare.

Near York (Spruce, 1842).

Near Kirkham Abbey (M.B.S.).

On the east coast near Cayton Bay (J. A. Wheldon).

Coatham Marshes (R. Barnes, 1892).

Fruiting 4-5 mths.

9. **A. confervoides** (Brid.) Br. Sch.

Montane B. Range 1-2.

On stones in calcareous districts, rare.

Near Hawnby in Bilsdale, amongst the eastern hills (Slater and Stabler, 1871).

On stones near Rivaulx Abbey (M.B.S.).

Amongst the western hills near Aysgarth Force, and Askrigg Wensleydale, also near Richmond and Kisdon Force. Swaledale (R. Barnes, 1889).

Fruiting 8 mth.

10. **A. Sprucei** (Bruch) Br. Sch.

(*Leskea Sprucei* Bruch.).

Montane B. Range 1-2.

Shady calcareous rocks, rare.

First discovered on stones near Winch Bridge, Teesdale, by the side of the stream, by R. Spruce, 1843.

Near Egglestone Abbey by the Tees (Baker).

In the Tees district, by the Westmorland side of Maize Beck, Langdon Beck, Ovington and Gainford. Also in Swaledale, at Kisdon Force, Gunnerside, and near Richmond (Barnes).

Amongst the eastern hills, on stones by Goathland Beck (M.B.S., 1855).

Fruiting 6 mth., very rare.

11. **A. riparium** (L.) Br. Sch.

(*Hypnum riparium* L.).

Range 1.

On stones and wood by streams and ditches, common

Common in damp places, and by stream sides in the low country (Baker).

Var. β . **longifolium** Schultz.

Near York (Spruce, 1841).

On stumps in a pond near Northallerton (Barnes).

Var. γ . **abbreviatum** Schp.

Coatham Marshes (R. Barnes, 1892).

Clifton Ings, York (Ingham, 1898).

Fruiting 6 mth.

12. **A. Kochii** (Br. Sch.). Lindb.

Range 1.

On stones by streams or ditches in shady places, rare or overlooked.

Clifton Ings, York, sterile (Ingham 1898).

(Sect. 2.—**CAMPYLIADELPHUS**. Lindb.).

13. **A. elodes** (Spruce) Lindb.

(*Hypnum elodes* Spruce).

Range 1.

Damp swampy ground, rare.

Stockton Forest, near York, discovered by Spruce, August, 1842.

Gilla Leys Wood, Castle Howard (Spruce).

Strensall Common (J. A. Wheldon).

Near Pilmoor, Wensley Bridge, and Semerwater (Barnes).

Fruiting 4-5 mths.

14. **A. chrysophyllum** (Brid.) De Not.

(*Hypnum chrysophyllum* Brid.).

Range 1-2.

Damp calcareous rocks, not very common.

Teesdale (Spruce 1843).

In quarry above Barton-le-Street, also on north side of Castle Howard Park wall, near Coneysthorpe (M.B.S.).

Hole of Horcum, near Pickering (G. Stabler, 1868).

Marske Mill, near Saltburn (Barnes).

Strensall (Ingham).

Fruiting 5 mth., rarely.

15. **A. protensum** (Brid.) Lindb.

(*Hypnum stellatum* β . *protensum* Schp.).

Range 1-2.

Wet rocks and stones in calcareous districts, not common.

Heslington Fields, near York, in fruit (Spruce, 1842).

Saltergate Beck on stones, and Newton Dale (M.B.S.).

Amongst the western hills at (Falcon Clints, Teesdale, in Durham) Kisdon Force, and near Catterick, Swaledale (Barnes, 1887).

Near Scarbro' (Ingham).

Fruiting 6 mth.

16. **A. stellatum** (Schreb.) Lindb.

(*Hypnum stellatum* Schreb.).

Range 1-3.

Marshy ground amongst grass, common.

Upon swampy heaths, ascending from Pilmoor and Stockton Forest to the upper zone peaks (Baker).

Terrington Car, Castle Howard, fruiting 1843 (Spruce).

Coatham Marshes, fruiting (Barnes).

Strensall, Kilburn, and Heworth, near York (Ingham).

Fruiting 6 mth.

17. **A. polygamum** Br. & Schpr.

(*Hypnum polygamum* Wils.).

Range 1.

In swampy places not common.

Terrington Car, Castle Howard, in fine fruit (Spruce, 1847).

Swampy ground in Sowerby Flats, near Thirsk (Baker and Davies).

Pilmoor and Strensall Common (Ingham).

Eskside, near Whitby (Baker).

Near Ruswarp, Eskside (Anderson).

Marske Mill, near Saltburn (Barnes).

Fruiting 5 mth.

Var. β . *stagnatum* Wils.

Near York (Spruce, 1847).

(Sec. 3.—**DREPANOCLADUS** C. Muell.

(*Harpidium* Sullivant).

18. **A. glaucum** (Lam.) Lindb.

(*Hypnum commutatum* Hedw.).

Range 1-3.

Damp, dripping calcareous rocks.

Frequent in damp places and on dripping rocks from the central valley to the upper zone peaks (Baker).

Teesdale and Gilla Leys, Castle Howard (Spruce, 1841).

Near Goathland (Anderson) (Ingham).

Fruiting 4-5 mths.

19. **A. decipiens** De Not.

Range 1-2.

Wet places amongst the hills, rare.

Swamps at the foot of Crosscliff, Langdale end, near Scarborough (G. Masee).

Sterile.

20. **A. falcatum** (Brid.) De Not.

Range 1-2.

Bogs and springs in calcareous districts.

Amongst the eastern hills by streams, tributaries of the Esk, especially near waterfalls.

Saltersgate Beck (M.B.S.).

In Teesdale on Holwick Scar, and near the High Force (Ingham, 1897).

Coatham Marshes.

Var. β *gracilescens* Schpr.

Near High Force, Teesdale, and Coatham Marshes (Ingham).

Var. γ *fluctuans* Br. et Schpr.

Rigmill, Whitby (Braithwaite, 1842).

Near High Force, Teesdale (Dixon, 1896).

Fruiting 6 mth.

21. **A. Sendtneri** (Schpr.) De Not.

(*Hypnum aduncum* Hedw.).

Range 1-2.

In swampy heaths and damp boggy ground, not rare.

Slingsby Moor, Castle Howard (Spruce, 1839).

Strensall Common (Holt).

Amongst the eastern hills at Darnholme, Goathland, fruiting (Anderson).

Askham Bog and Coatham Marshes (Ingham)

Var. β . **Wilsoni** (Schp.) Lindb.

Strensall Common (Holt, 1886).

22. **A. intermedium** Lindb.

Range 1.

Swamps and peat bogs, rare or overlooked.

Strensall Common, near York (Holt, 1886).

Coatham Marshes (Ingham).

Fruiting 6-7 mths., very rarely.

23. *A. revolvens*. (Sw.) De Not.

Montane. Range 1-3.

In swampy peat bogs.

Not uncommon amongst the hills of both ranges (Baker).

Amongst the eastern hills near Goathland, Randymere, Egton (Anderson).

Fruiting 4-5 mths.

24. *A. lycopodioides* (Neck.) De Not.

Range 1.

Swamps and peat bogs, rare.

Strensall Common (Spruce, 1847).

Same locality (Ingham, 1898).

In the west, on the banks of Seamer water, also with *A. scorpioides* on Pilmoor and Stockton Forest (Baker).

Fruiting 5 mth., very rarely.

25. *A. vernicosum* Lindb.

Montane A. Range 2-3.

Wet bogs on the hills amongst the heather, rare.

Mickle Fell (Wheldon).

[This is the only locality I am able to record for this moss, which seems to be confined to the higher hills of the western district (M.B.S.).

Fruiting 7 mth. very rarely.

26. *A. aduncum*. (L.) Lindb.*(Hypnum uncinatum* Hedw.).

Range 1-2.

Damp shady rocks.

Not uncommon in damp shady places amongst the hills (Baker).

On the western hills in Teesdale (Spruce).

On the eastern hills at Saltersgate, Arncliffe Wood, Eskdale, &c. (Anderson).

Near Hackness (Ingham).

Var. β . **plumosum** Schpr.

On tree near Saltburn (Ingham, 1897).

Var. γ **plumulosum** Schpr.

Holwick Scar, and near High Force, Teesdale (Ingham).

Fruiting 6 mths.

27. **A. exannulatum** (Guemb.). De Not.

Montane B. Range 1-2.

Swampy places amongst the hills, not common.

Terrington Car, Castle Howard (Spruce, 1842).

Amongst the western hills about the tarn in Lunedale, and between Cronkley Scars, and the Tees in Teesdale.

In the east at the head of Ingleby (Baker).

Randymere, Egton, near Whitby (Anderson).

Strensall Common (Wheldon).

Var. ϵ **brachydictyon** Ren.

Strensall Common (Wheldon).

Pilmoor (Ingham).

Var. γ **Rotæ** De Not.

Pilmoor and Strensall Common (Ingham).

Fruiting 5-6 mths. very rarely.

28. **A. fluitans** (L.) De Not.

Range 1-2.

Swamps and peat bogs.

Near York, and in Teesdale (Spruce).

Common, ascending from the vale heaths to the upper zone peaks (Baker).

Randymere, Egton, near Whitby.

Var. ζ **falcatum** Schpr.

Var. ϵ **Arnellii** Sanio.

On Strensall Common and Terrington Carr (Ingham).

Fruiting 4-6 mths., not common in fruit.

29. **A. Kneiffii** Schpr. (Bry. Eur.).

Range 1.

Swamps and peat bogs, not common.

Slingsby Moor, Castle Howard (Spruce).

Terrington Carr (M.B.S.).

In the central valley in a swamp near the footroad about a mile from Thirsk in the direction of Bagby (Baker).

Var. β . **gracilescens** Schpr.

Clifton Ings, York (Ingham, 1897).

Var. θ **paternum** Sanio.

Strensall Common (Holt).

Var. ϵ **polycarpon** Bland.

Near Scarborough (Wheldon).

Var. δ **intermedium** Schpr.

Strensall Common (Holt).

Fruiting 6 mth. not common.

(Sect. 4.—**SCORPIDIUM** Schp.).

30. **A. scorpioides** (L.) Lindb.

Range 1-2. Montane C.

Swampy heaths.

Strensall Common, fruiting, also in Teesdale and Terrington Carr, Castle Howard (Spruce).

Frequent in swampy heaths amongst the hills (Baker).

Near Northallerton (Wheldon).

Fruiting 5 mth. not common in fruit.

(Sect. 5.—**HYGROHYPNUM** Lindb.)

(*Limnobium* Bry. Eur.).

31. **A. palustre** (Huds.) Lindb.

Range 1-3.

Rocks and stones in damp shady places, and by streams.

Common in Teesdale, and in the Castle Howard district (Spruce, 1843).

Ascending to the tarn on the end of the Fell on the north source of the Swale (Baker).

Plentiful by the streams amongst the eastern hills (M.B.S.).

Fruiting 5 mth.

Var. β . **subsphæricarpon** (Schleich.).

Amongst the eastern hills by the Esk and its tributary streams, not uncommon (M.B.S.).

32. **A. ochraceum** (Turn.) Lindb.

Range 1-2.

On wet dripping rocks amongst the hills, not common.

Arncliffe Wood, Eskdale, and Saltersgate Beck, on the eastern moorlands (Crouch 1875).

In Bilsdale, on rocks in the streamlet which flows into the main stream from the north end of Easterside (Baker).

Fruiting 6 mth.

Var. β . **flaccidum**, Milde.

Arncliffe Wood, Eskdale (Ingham).

33. **A. eugyrium** (Bry. Eur.) Lindb.

Range 1-2.

On stones by streams amongst the hills, rare or overlooked.

On stones by the Esk at Arncliffe Wood, Eskdale (Stabler).

Fruiting 5 mth.

(Sect. 6.—**CALLIERGON.** (Sull.) Lindb.).

34. **A. giganteum** (Schpr.) De Not.

Range 1-2.

In swamps, rare.

Found by Mr. Mudd in Sleddale, and by Mr. Davies in a bog near Whitstoncliffe (Baker).

Holwick Fell, Teesdale (Barnes).

By the Tees above High Force (M.B.S.).

Strensall Common (Ingham).

Chandler's whin ponds near York (Webster).

In Wensleydale. At Pilmoor and near Croft, fruiting (Barnes 1892).

Fruiting 4-5 mths., very rarely.

35. **A. cordifolium** (Hedw.) De Not.

Range 1-2.

Swampy places.

Frequent in swampy ground amongst hills (Baker).

Strensall Common (Wheldon).

Askham Bog and near Foss, York (Ingham).

Fruiting 4-5 mths.

36. **A. sarmentosum** (Wahl.) De Not.

Montane B. Range 3.

Swampy ground, rare.

Gathered on damp ground on the slope of Micklefell.

Teesdale, towards Maze Beck (Baker 1856).

Holwick Fell and near White Force (Barnes).

Fruit very rare in Britain and only in few localities in Europe.

Fruiting 5-6 mths.

37. **A. stramineum** (Dicks.) De Not.

Range 1-2.

In swamp bogs, rare.

Terrington Car, Castle Howard (Spruce, 1842).

On the west near Lunedale Tarn. In the central vale in Halnaby Car. On the east in Kildale, Sleddale, Rosedale and Bransdale, and on Guisbro', Kirby, and Carlton Moors (Baker).

On Green Fell, Teesdale; by the side of the Swale above Keld. At Lockwood Beck, Cleveland, and near Gormire, Thirsk (Barnes).

Halnaby Carr, fruiting (July, 1879, Barnes).

Fruiting 5 mth, rarely found.

HYPNUM Dil. L.

(Sect. 2.—**SCLEROPodium** Bry. Eur.).

1. *H. purum* L.

Range 1-3.

Common amongst grass in shady, damp places.

Ascending from the central valley to the upper zone peaks, rarely fruiting (Baker).

Scackleton Moor and Castle Howard Park, also near York with fruit (Spruce, 1839).

Hildenby stone quarry, Malton, with fruit (M.B.S.).

Near Roxby and Saltburn in Cleveland, with fruit (Barnes).

Near Falling Foss, Whitby, *c. fr.* (Braithwaite).

Fruiting 10-11 mths., rarely.

2. *H. caespitosum* Wilson.

Range 1.

About the roots of trees, near river banks in the low country, where subject to inundation, rare.

Near York on the banks of the Ouse (Spruce, 1843).

Fruiting 11 mth.

Sect. 3.—**PANCKOWIA** (Neck.) Lindb.*(Eurhynchium* Schpr.).3. **H. striatum** Schreb.

Range 1-2.

In shaded woods on the earth.

Common in shaded places, both in the low country and amongst the hills (Baker).

Plentiful in several of the Castle Howard Woods, with fruit (Spruce, 1838).

Near Roxby, Cleveland, fruiting (Barnes).

Near Hackness (Ingham).

Fruiting 12 mth., not uncommon.

4. **H. crassinerve** Tay.

Range 1-2.

On damp calcareous rocks in shaded places.

Not unfrequent amongst both ranges of hills (Baker).

Mowthorpe Dale, Castle Howard, Kirkdale, Kirby-Moor-side, and near High Force, Teesdale (Spruce, 1843).

Near Ovington and Winson, in Teesdale, fruiting.

Near Aysgarth, also near Keld and Richmond, in Swaledale (Barnes).

Amongst the eastern hills, near Goathland, and in Eskdale (M.B.S.).

On stones in the Saltburn Gardens, in Cleveland (Barnes).

Fruiting 11 mth.

5. **H. pallidirostre** A. Braun.*(H. pumilum* Wils.).

Montane. Range 1-2.

Shaded rocks amongst the hills, rare.

In the west Swale district, in Punchards Gill, and Billy Bank Wood near Richmond. In Cleveland, in Cronkley

Gill. Upon the slope of the Hambleton Range from Hambleton end to Kilburn Bank (Baker).

In Mowthorpe Dale, Castle Howard (Spruce).

Winston Bridge, Teesdale, and several places in Cleveland, near Saltburn (Barnes).

Goathland Beck and near Whitby (M.B.S.).

Deepdale near Bowes (Barnes).

Fruiting 11 mth., not common.

6. *H. prælongum* L.

Range 1-3.

On stones and rocks in shaded places, frequent.

Ascending from the central valley to the main limestone of Mickle Fell (Baker).

Castle Howard Woods, also at Hackness near Scarbro', and in the Eskdale district (Spruce, 1843).

Coxwold, Tockwith, and Saltburn (Ingham).

Fruiting 11 mth., not uncommon.

Var. β . *Stokesii* Turner.

In Cronkley Gill, Eskdale (M.B.S.).

7. *H. Swartzii* Turn.

Range 1-2.

On the earth in shaded places.

Not unfrequent both in the low country and amongst the hills (Baker).

In Castle Howard Woods, and near Hackness (Spruce, 1847).

Plentiful on the earth in shaded places, near Malton (M.B.S.).

Near Saltburn, in Cleveland (Barnes).

Strensall and Clifton Ings (Ingham).

Fruiting 11 mth., rarely.

8. *H. speciosum* Brid.

Range 1.

On stones and near tree stumps, &c., rare.

Found by Mr. J. H. Davies on submerged stumps in the neighbourhood of Thirsk (Baker).

Clifton Ings, York (Ingham).

Fruiting 12 mth.

(Sect. 4.—*RHYNCHOSTEGIELLA* Schmp.).

9. *H. Teesdalei*. Sm.

Range 1-2.

On stones by streams, rare.

Found by Mr. J. H. Davies in a ditch near the east end of Codbeck below Sowerby, near Thirsk (Baker).

On the banks of Rigg Mill Beck, near Whitby (Braithwaite).

In Teesdale, near the High Force, Ovington and Gainford. In Swaledale, near Kisdon Force, and Richmond, near Weasley Mill, and in Cleveland at Easington, Kilton, Liverton, Roxby, and Saltburn (Barnes).

Near Rokeby (Barnes).

Fruiting 3-6 mths., not common.

10. *H. curvisetum* Brid.

Range 1-2.

On stones by streams, rare.

On stones in the upper part of stream running into Whitby harbour near New Gardens (M.B.S. 1879).

Near Roxby in Cleveland, fruiting (Barnes).

Fruiting 9-11 mths., rare.

11. *H. Algirianum* Brid.*(H. tenellum* Dicks.).

Xerophilous. Range 1-2.

On shaded calcareous rocks, rare.

On stones in Oxcars Wood, and in hedgerows near Welburn, Castle Howard (Spruce, 1842).

Billy Bank Wood, near Richmond (Ward).

Whitstoncliff (Baker).

On shaded limestone rocks by the Tees at Ovington and Winston Bridge. In the Swale district at Limekiln Wood, Catterick, and at Aysgarth Force (Barnes).

Hildenley Wood, near Malton (M.B.S.).

Near Masham (J. A. Wheldon).

Fruiting 10 mth.

(Sect. 5.—**RHYNCHOSTEGIUM** (Bry. Eur.). Lindb.).12. *H. piliferum* Schreb.

Range 1-2.

Shaded places on the ground.

Frequent in both the low country and amongst the hills, but rarely fruiting (Baker).

Mowthorpe Dale, Castle Howard, in fine fruit (Spruce, 1840).

Goathland Beck (M.B.S.).

Near Roxby, Cleveland, fruiting (Barnes).

Fruiting 11 mth., very rarely fruiting.

13. *H. rusciforme* Neck.

Range 1-2.

Common in streams in the low country and amongst the hills (Baker).

Crambeck rivulet, Castle Howard, in fine fruit (Spruce, 1837).

Fruiting 9-11 mths.

Var. β . *atlanticum*, Brid.

Near Helmsley (Ingham, 1897).

14. *H. murale* Neck.

Subxerophilous. Range 1-3.

Common on limestone rocks, and occasionally by stream sides and in other places, ascending from the central valley to the main limestone scars of Widdale Fell (Baker).

Very plentiful on limestone in the Castle Howard district (Spruce, 1843).

On shady side of old limestone walls at Hildenley and Malton, very abundant (M.B.S.).

Fruiting 10-12 mths.

15. *H. confertum* (Dicks.). Br. et Schp.

Range 1-2.

Frequent in shaded places in the low country and amongst the hills (Baker).

On trees in the Castle Howard Woods in many places (Spruce, 1842).

Near Malton in hedgerows (M.B.S.).

Near Scarbro' (J. A. Wheldon).

Fruiting 9-12 mths.

(Sec. 6.—**BRACHYTHECIUM** Schp. (Bry. Eur.) Schp.).

16. *H. velutinum* L.

Range 1-2.

Frequent upon hedgerows and in shaded places both in the low country and amongst the hills (Baker).

Near York (Spruce, 1842).

Near Malton (M.B.S.).

Fruiting 11-12 mths.

17. *H. pseudo-plumosum* Brid.(*H. plumosum* Swartz).

Range 1-3.

Frequent in damp places, especially amongst the hills ascending to the main limestone of Mickle Fell (Baker).

Very abundant on stones by the Esk at Arncliffe Wood, Eskdale, near Whitby (M.B.S.).

Gilla Leys, Castle Howard (Spruce, 1844).

Var. *oxystegium* Spruce M.S.S.

On stones at Coneysthorpe, Castle Howard (Spruce, 1879).

Fruiting 9-3 mths.

18. *H. viride* Lamk.

(*H. populeum* Hedw.).

Range 1-2.

Shaded banks, frequent, especially amongst the hills (Baker).

Wass Bank (Ibbotson, 1842).

Stones near Obelisk, Castle Howard (Spruce, 1843).

Var. β *majus* Schimpr.

Near Masham, on trees (M.B.S.).

Fruiting 11-2 mths.

19. *H. rutabulum* L.

Range 1-3.

Common in shaded places, on stones, walls, trees, &c.

Ascending from the central valley to the upper zone peaks (Baker).

Fruiting 11 mth.

Var. β . *longisetum* Bry. Eur.

Strensall Common (Ingham).

Var. ζ *robustum* Schp.

Wet places in woods and by streams.

20. *H. rivulare* Bruch.

Range 1-2.

On damp rocks by the sides of streams, not uncommon but rarely fruiting (Baker).

Mowthorpe Dale, Castle Howard, fruiting (Spruce, 1837).

Banks of Cod Beck near Kilvington (Baker).
 Goathland Beck on stones (M.B.S.).
 Near Guisbro' and Saltburn, fruiting (Barnes).
 Fruiting 11 mth. rarely.

21. *H. plumosum* Huds.

(*H. salebrosum* Hoffm.).

Range 1.

On trees and stones in shaded woode, rare.
 On trees in Oxcars wood, Castle Howard, and in Oak-cliff wood near Whitwell (Spruce, 1847).
 Fruiting 11 mth.

Var. β *Mildei* Schpr.

Amongst grass under fruit tree in orchard at Malton (M.B.S. 1855).

Pasture near Marke Mill, Cleveland (Barnes).
 Fruiting 11 mth.

22. *H. albicans* Neck.

Range 1.

Not uncommon in the low country on sandy ground and on old thatched roofs, rarely fruiting (Baker).

Holly hill wood, Hovingham (Spruce, 1841).

Near York (Spruce, 1844).

On the cliff slopes north of Whitby, fruiting (Anderson, 1876).

Near Terrington, Castle Howard (M.B.S.).

Near Strensall, fruiting (Wheldon).

Saltburn, Kilburn, and Coatham Marshes (Ingham).

Fruiting 11-12 mths.

23. *H. glareosum* B. et Schp.

Range 1-2.

In shaded places both in the low country and amongst the hills.

Ascending from the central valley to Shaw's Gill above Hardraw Force (Baker).

Stockton Forest and near Castle Howard (Spruce, 1842).

Near Richmond, and in Cleveland at Kilton and Roxby, fruiting (Barnes).

Wassbank Woods (Marshall).

Fruiting 11 mth.

Sect. 7.—**PLEUROPUS** (Griff.) Mitt.

24. **H. lutescens** Huds.

Subxerophilous. Range 1-3.

On stones and rocky places on dry calcareous banks.

Frequent amongst the calcareous hills, ascending from the coast sand hills to the main limestone of Camfell and Ten end (Baker).

On stones at Hildenley quarry and near Coneysthorpe, Castle Howard (Spruce, 1846).

Sandy bank near Saltburn (Barnes).

Calcareous banks near Malton (M.B.S.).

Near Kirby Moorside (Ingham).

Fruiting 9-10 mths.

25. **H. sericeum** L.

Range 1-3.

In shade upon trees and rocks, old walls, &c.

Abundant everywhere ascending from the central valley to the upper zone peaks (Baker).

In the Castle Howard district, common and fruiting finely (Spruce, 1837).

Fruiting 11-2 mths.

26. **H. trichoides** (Neck.) Lindb.

(*H. nitens* Schreb.).

Range 1-2.

Swampy places and peat bogs, rare.

In the Howardian tract in the north Car at Terrington,

fruiting finely, and in a swamp below the head hag at Coneysthorpe (Spruce, 1842).

In the central valley, abundant with *Thuidium Blandovii* in Halnaby Car. Amongst the eastern hills in Codhill bog, Guisbro'; Flazendale and Beckdale, Helmsley (Baker).

Swampy ground near the High Force, Teesdale (M.B.S.).

Fruiting 5 mth., only seldom found.

Isothecium Brid. Bryo. Univ.

1. *I. viviparum* (Neck.) Lindb.

(*I. myurum* Brid.).

Range 1-3.

Common in shaded places.

Ascends from the central valley to the main limestone of Mickle Fell (Baker).

In Cum Hagg and other Castle Howard woods, fruits abundantly (Spruce, 1837).

Goathland Beck, and in Eskdale and its tributaries (M.B.S.).

Fruiting 10-11 mths.

2. *I. myosuroides*. (L.). Brid.

Range 1-3.

On stones and trees in woods and shaded places.

Frequent, especially amongst the hills ascending from the central valley to the main limestone of Mickle Fell (Baker).

In the Castle Howard woods, and in Eskdale, abundant (Spruce, 1841).

Troutsdale, near Hackness (M.B.S.).

Fruiting 11 mth.

Var. *filescens*, Ren.

Kirkdale (Ingham, 1899).

Pterogonium Sw.

1. *P. ornithopodioides*, (Huds.) Lindb.

(*P. gracile* Swartz.).

Montane A. Range 1-2.

Damp shaded rocks and walls, not common.

In Upper Swaledale, on walls between Keld and Muker (Baker).

In Upper Teesdale (Spruce, 1843).

Near Richmond (Barnes).

Fruiting 11 mth., rarely.

Helicodontium Schwgr.

1. *H. pulvinatum* (Wahlenb.) Lindb.

(*Myrinia pulvinata* Schpr.).

Range 1.

On trees, &c., on river banks subject to occasional inundation, rare.

On trees and bushes near the Ouse along Clifton Ings, near York (Spruce, 1841).

Gathered in same locality (J. A. Wheldon, 1889).

Holgate Beck, York (G. Webster).

Fruiting 5-6 mths.

(Sub. Fam. 3. STERIODONTEÆ).

(A. THELIEÆ).

Heterocladium Bry. Eur.

1. *H. heteropterum* Bruch.

Montane B. Range 1-3.

Moist, shaded rocks and stones amongst the hills near waterfalls.

Not uncommon on both ranges of hills from Cockmill

Woods, near Whitby, to the main limestone of Mickel Fell (Baker).

In Eskdale and Teesdale (Spruce, 1842).

Near Mallyon Spout, Goathland (M.B.S.).

Cronkley Gill, Eskdale (Anderson, 1871).

Kilton Beck, in Cleveland; Slape Wath, Easington, and Saltburn (Barnes).

Fruiting 11 mth., very rarely fruiting.

(B. EUSTEREODONTEÆ).

Hylocomium Bry. Eur.

(Sect.. A.—EUHYLOCOMIUM Lindb.).

1. **H. brevirostre** (Ehrh.) Bry. Eur.

Range 1-2.

On stones, &c., in shaded damp woods, not common.

In Gunnerside Gill and Woods near Richmond.

On the east in Whitstoncliff Woods (Baker).

Near Kisdon Force, Upper Swaledale (Barnes).

Whitfield Gill, Wensleydale, fruiting (Barnes).

Fruiting 10-11 mths., rarely.

2. **H. proliferum** (L.) Lindb.

(*H. splendens* Dill.).

Range 1-3.

On grassy banks, and in woods, &c.

Common in shaded and damp places, ascending from the central vale to the upper zone peaks, rarely found fruiting (Baker).

Towthorpe Moor, near York, and Cum Hagg Wood, Castle Howard, with fruit (Spruce, 1838).

Near Saltersgate, fruiting (M.B.S. 1883).

Fruiting 4 mth., rarely.

(Sect. B.—PLEUROZIUM).

3. *H. parietinum* (L.) Lindb.(*H. Schreberi* Willd.).

Range 1-3.

Woods and shady heathery banks, plentiful, rare in fruit.

Common upon heaths and hedgebanks, ascending from the central valley to the upper zone peaks (Baker).

Scackleton Moor, near Castle Howard, fruiting (Spruce, 1839).

Near Saltergate, in fruit (M.B.S.).

Widdy Bank, fruiting (Barnes).

Fruiting 10-11 mths.

(Sect. C.—RHYTIDIADELPHUS Lindb.).

4. *H. triquetrum* (L.) Bry. Eur.

Range 1-3.

On shaded banks and in woods, frequent, not common in fruit.

Plentiful everywhere in shaded places ascending from the central valley to the upper zone peaks (Baker).

Mowthorpe Dale, Castle Howard, fruiting (Spruce, 1837).

Gilla Leys, Castle Howard, in very fine fruit (M.B.S. 1847).

Holwick and Dry Gill, Teesdale, fruiting (Barnes).

Near Hemsley (Ingham).

Fruiting 11 mth., rarely found in fruit.

5. *H. squarrosum* (L.) Bry. Eur.

Range 1-3.

Shaded grassy banks and in woods, not common in fruit.

Everywhere plentiful in damp places, ascending from the central valley to the upper zone peaks (Baker).

Near York, and in Gilla Leys, Castle Howard, fruiting (Spruce, 1846).

Near Hawnby in Bilsdale, fruiting (M.B.S.).

Billy Bank Wood, Richmond, and near Holwick, fruiting (Barnes.)

Fruiting 11 mth., rarely.

6. **H. loreum** (L.) Bry. Eur.

Range 1-3.

In shaded woods and banks, not common in fruit.

Frequent in shaded places, especially amongst the hills ascending to the upper zone peaks (Baker).

Callidge Wood, Castle Howard, and near Hackness, fruiting (Spruce, 1840).

Near Goathland on grassy shaded banks, fruiting (M.B.S.).

Dry Gill, Teesdale, fruiting (Barnes).

Fruiting 11 mth., only rarely.

(Sect. D.—**RHYTIDIUM**).

7. **H. rugosum** (L.) De Not.

Montane A. Range 3.

On the high limestone above Cronkley Fell, Upper Teesdale (H. Ibbotson. 1843).

Abundant on the sugar limestone of Widdy Bank Fell on the Durham side of the river (Baker).

Always sterile.

Fruiting 7 mth., very rarely.

Campylium (Sull.) Mitt.

1. **C. hispidulum** (Brid.) Mitt.

Var. **Sommerfeltii** (Myrin.) Lindb.

(*Hyp. polymorphum* Bruch Mss.).

Range 1-2.

On calcareous rocks and stones, not common.

Gilla Lees and near Coneysthorpe, Castle Howard, and in Teesdale (Spruce, 1843).

Lyons Plantation, and in Hildenley Wood, near Malton (M.B.S.).

On the Tees near Rokeby and Winston Bridge ; in Swaledale near Kisdon Force, also near Richmond and Catterick (Barnes).

Fruiting 5 mth.

Ctenidium (Schpr.) Mitt.

1. **C. molluscum** (Hedw.) Mitt.

(*Hyp. molluscum* Hedw.).

Range 1-3.

On rocks and shaded banks, frequent.

Amongst the hills ascending to the main limestone of Mickle Fell, and the limestone pavement of Camfell and Widdale Fell (Baker).

Plentiful in Teesdale (Spruce).

Common amongst the eastern hills near Goathland, &c. (M.B.S.).

Fruiting 11 mth., not frequent in fruit.

Var. ϵ **fastigiatum** Boswell.

Kilburn, base of Hambleton Hills (W. Ingham, 1898).

Hyocomium Schpr.

1. **Hyocomium flagellare** (Dicks.) Schpr.

Montane B. Range 1-2.

Moist shaded rocks amongst the hills, especially near waterfalls, rare in fruit.

Frequent upon rocks by streams amongst both ranges of hills (Baker).

Rigg Mill Beck, Eskdale (Braithwaite, 1842).

Cronkley Gill, Eskdale (Spruce, 1847).

Blue Berry Gill, Goathland (M.B.S. 1876).

Fruiting 10-11 mths., very rarely.

Ptilium (Sull.) De Not.1. **P. Crista-castrensis** (L.) De Not.*(Hyp. Crista castrensis L.)*.

Montane. Range 1-3.

In shady woods and banks, rare.

In the Howardian tract, in a hollow near the entrance from Ganthorpe to Castle Howard Park (now extinct in this locality) (Ibbotson).

On the south side of the Tees near Gainford (Backhouse).

In the central valley in woods near Croft (Dalton).

In Upper Teesdale amongst the heather on the edge of Cronkley Fell (Black).

Fruiting 7-8 mths., very rarely.

Stereodon (Brid.) Mitt.(Sec. A.—**DREPANIUM** Schpr. **HYPNUM** Dill).1. **S. Lindbergii** Mitt.*(Hyp. pratense var. hamatum Schp.)*.

Range 1.

Damp grassy shaded places, not common.

Raywood, Castle Howard (Spruce, 1847).

On the west, near the Yore, between Masham and Tanfield. In the central valley between Sowerby and Dalton, and near the Tees at Croft. In the Vale of Mowbray, in Gurtoff Gill, and at the foot of Black Moor, near Westow (Baker).

West Stonesdale Beck, Swaledale, and at Hawnby (Barnes).

Strensall Common (Ingham).

Fruiting summer, not found in Britain.

2. **S. imponens** (Hedw.) Brid.

Range 1.

Wet sandy heaths, rare.

Strensall Common, near York (Wilson and Hunt).

Fruiting 9-10 mths., very rare.

3. **S. cupressiformis** (L.) Brid.

Range 1-3.

On walls, rocks, trunks of trees, &c.

Common, ascending from the central valley to the upper zone peaks (Baker).

Var. β . **compressum** Wils. (*ericetorum* B.E.).

Sackleton Moor, near Castle Howard (Spruce, 1839).

Not uncommon on sandy heaths.

Strensall Common (Ingham).

Var. **lacunosum** Wils. (*elatum* Schpr.).

Stockton Forest (Spruce).

Near Hawnby (M.B.S.).

On stones in moist districts amongst the hills.

Var. **filiforme** Wils.

On trunks of trees in hilly districts.

Near Goathland, Castle Howard, &c. (M.B.S.).

Var. **minus** Wils.

Castle Howard (Ingham).

Fruiting 11-12 mths.

4. **S. resupinatus** (Wils.) Braith.

Range 1-2.

On walls, rocks, and trunks of trees, not uncommon.

Growing often in company with the preceding moss.

On trees and stones in Castle Howard Park (Spruce, 1847).

On stones in Stainton Dale, near Scarborough (S. Chadwick, 1889).

Goathland (Ingham).

5. *S. hamulosus* (Brid.) Lindb.

Range 2.

In damp shaded places amongst the western hills, rare. On Holwick Scars, Teesdale, gathered by A. O. Black (Baker).

Fruiting 5-6 mths.

Sec. B. *PYLAIEA* (B. et S.) Mitt.

6. *S. incurvatus* (Schrad.) Mitt.

(*Hyp. incurvatum* Schrad.).

Montane A. Range 1-2.

On walls and stones, mostly in limestone districts, not frequent.

On stones by the Tees below the High Force (Spruce, 1843).

Near Winston, Teesdale, and at Aysgarth and Askrigg, Wensleydale (Barnes).

Fruiting 6-7 mths.

7. *S. polyanthos* (Schreb.) Mitt.

(*Leskea polyanthos* Hedw.).

Range 1.

Occasionally upon trees in the low country, not common.

Near York and Castle Howard (Spruce, 1841).

On tree at Crambeck, Castle Howard (M.B.S., 1847).

At Aysgarth, Thirsk, and in Flaxendale (Baker).

Stanwick Park, and in hedgerow between Loftus and Grinkle (Barnes).

Fruiting 6-7 mths.

8. **S. subrufus** (Wils.) Lindb.*(Leskea subrufa* Wils.).*(Orthothecium intricatum* (Hart.) Schpr.).

Montane A. Xerophilous Range 2-3.

Sub-alpine rocks, not unfrequent, but always sterile. Upon most of the upper Teesdale Cliffs, descending to the river at High Force, ascending to the limestone edges of the northern slope of Mickle Fell. In Gretadale on Gilman-scar. In the west Swale district on Kidson Scars, and at the waterfall in Punchards Gill. In the Yore district at Clough Woods, Fossdale, and plentiful at the highest waterfall in Coverdale (Baker).

Descending in Swaledale to Richmond; Aysgarth Force (Barnes, 1893).

Fruiting 8 mth., very rarely.

Has only been found with fruit in Norway, and a few other places.

Isopterygium Mitt. (*Hypnum* Dicks.).1. **I. depressum** (Bruch) Mitt.*(Rhynchostegium depressum* Schpr.)

Montane B. Range 1-2.

On rocks and stones, especially such as are calcareous, often growing with *R. murale* and *R. crassinervium*. Rarely fruiting.

Mowthorpe Dale, and Oxcars Wood, Castle Howard, (Spruce, 1847).

On stones in the lower part of Balderdale.

In the Vale of Mowbray, in Stonecliff Wood.

Frequent, both in the glens and upon the western and southern slopes of the Hambleton Hills (Baker).

On limestone near Hawnby, in Bilsdale, fruiting.

Near Richmond, fruiting ; also on stones in Kilton Wood, Cleveland (Barnes).

Cronkley Gill, and near Winston, fruiting (Barnes).

Oxcars Wood, Castle Howard, in fruit (Braithwaite and Slater, Sept. 1892).

Kirkdale (Ingham).

Fruiting 4-6 mths., very rarely.

2. *I. elegans*. (Hook.) Lindb.

Hypnum elegans (Hook. Musci Exotici).

(*Plagiothecium Borrerianum* Spruce Journ. Bot.).

Montane B. Range 1-2.

On shaded banks and rocks, not uncommon, often growing with *P. denticulatum*, generally sterile.

Plentiful in some of the Castle Howard Woods, and also in Eskdale, near Whitby (Spruce, 1846).

Stockton Forest, near York (Spruce, 1847).

Frequent, on shaded rocks amongst both ranges of hills (Baker).

Near Mallyon Spout, Goathland, in old fruit (M.B.S. Aug. 1879).

Var. *longinerve* Spruce, M.S.S.

Coneysthorpe Bank Wood, Castle Howard, (M.B.S. 1880).
Fruiting 3-4 mths., very rarely.

3. *I. pulchellum* (Dicks.) Mitten.

(*Hypnum pulchellum* Dicks.).

Montane B. Range 1-2.

Shaded rocks in hilly districts, not common.

In Teesdale, (Spruce, 1843).

Cronkley Gill, Eskdale (Spruce).

Upon most of the Teesdale Scars, from Cronkley Fell eastward to Crossthwaite Beck. In the west Swale District,

in Whitstondale and Punchards Gill. In the Yore District at the upper part of Cotterdale (Baker).

Amongst the eastern hills, near Saltersgate (M.B.S.).

Var. β . **nitiduru** (Wahl.).

Cronkley Fell, Teesdale (Spruce).

Fruiting 6-7 mths.

4. **I. repens** (Pollich).

(*Plagiothecium silesiacum* Schpr.).

Range 1-2.

On decaying trees, rocks, stones, &c., rare.

On rocks in Arncliffe Wood, Eskdale, and in Cronkley Gill, near Whitby (Spruce, 1847).

Fruiting 5-6 mths.

Plagiothecium B. et S.

1. **P. undulatum** (L.) B. et S.

Range 1-3.

In woods and heathy places, not uncommon.

In several of the Castle Howard woods (Spruce, 1840).

Common, in shaded places amongst the hills ascending to the upper zone peaks (Baker).

Very abundant in Arncliffe Wood, Eskdale, near Whitby, also near Mallyon Spout, Goathland (M.B.S.).

Fruiting 4-5 mths.

2. **P. silvaticum** (Huds.) B. et S.

(*Hypnum silvaticum* Huds. *Fl. Anglica*).

Range 1-3.

In woods at the roots of trees, and in hedge banks, not uncommon.

In several of the Castle Howard woods (Spruce).

Common in shaded places ascending from the central valley to the main limestone of Mickle Fell (Baker).

Near Mallyon Spout, Goathland, fruiting (M.B.S.).

Fruiting 9 mth., only seldom.

3. *P. denticulatum* (L.) B. et S.

Range 1-2.

In woods and on hedge banks, frequent.

Common in damp and shaded places, especially amongst the hills (Baker).

Var. *aptychus* Spruce.

Coneysthorpe Bank Wood, Castle Howard, in fine fruit (Slater and Stabler, July 1880).

Langwith Woods on decayed tree stump (G. Webster).

Fruiting 6-7 mths.

(For description of this variety, consult excellent article by R. Spruce in *London Journal of Botany*, Dec. 1880).

4. *P. latebricola* (Wils.) B. et S.

(*Leskea latebricola* Wils. M.S.S.).

Range 1-2.

Moist shady woods, on decaying trunks of trees, &c., not common.

On decaying stumps in Blueberry Gill, Goathland, also in Cronkley Gill, Eskdale, Whitby (M.B.S. 1881).

On decaying alder stumps, Slape Wath, near Guisbro', fruiting; and at Easington Gill and Roxby, near Staithes, fruiting (Barnes).

Fruiting 11-12 mths., rarely.

Aerocladium Mitten.1. **A. cuspidatum** (L.) Mitt.*(Hypnum cuspidatum L.)*.

Range 1-3.

Common in marshy and damp places.

Ascending from the central valley to the upper zone peaks (Baker).

In Terrington Carr, fruiting; and in the Castle Howard district in many places (Spruce, 1837).

In Saltersgate Beck, and abundant in wet, marshy places amongst the eastern moorlands (M.B.S.).

Fruiting 5-6 mths. Not frequent in fruit.

Entodon C. Muell.1. **E. orthocarpus** (L. Pyl.) Lindb.*Clyndrothecium concinnum* (De Not) B. et S.

Xerophilous Range 1-2.

On rocks and stones in old quarries in limestone districts, rare.

In the Howardian tract, in the limestone quarries at Hildenley, near Malton, and near Welburn, Castle Howard (Spruce, 1846).

On the sugar limestone of Widdy Bank Fell, Teesdale, Durham (Baker).

In an old quarry by the road side to Newton, near Pickering, and in old quarry in Sleightholme Dale, near Kirby Moorside (M.B.S. 1890).

Fruiting autumn. Very rare. Not found in fruit in Britain.

Pterygophyllaceæ.1. **Pterygophyllum lucens** (L.) Brid.*(Hookeria lucens* Sm.).

Range 1-2.

Moist banks in woods and amongst rocks.

Frequent in damp places amongst both ranges of hills
(Baker).

Gilla Leys, Castle Howard (Spruce, 1839).

Near Hackness, Scarbro' (M.B.S.).

In Easington Gill, near Saltburn, fruiting (Barnes).

Fruiting 11-12 mths.

NECKERACEÆ.Sect. 1.—**NECKERÆ.****Porotrichum** (Brid.) Mitt.1. **P. alopecurum** (L.) Mitt.*Thamnum alopecurum* (L.) Schpr.

Range 1-2.

In moist, shady woods on rocks.

Common in shaded and damp places in the low country
and amongst the hills (Baker).

Mowthorpe Dale, Castle Howard, fruiting (Spruce, 1837).

Hildenley Wood, near Malton, fruiting abundantly; and
Goathland Beck (M.B.S.).

Kilton, in Cleveland, fruiting (Barnes).

Fruiting 11 mth. Not common with fruit.

Homalia Brid.1. **H. trichomanoides** (Schreb.) Brid.*(Hypnum trichomanoides* Schreb.).

Range 1-2.

Trunks of trees and shaded rocks.

Not uncommon upon trees, and sometimes on walls,
both in the low country and amongst the hills (Baker).

Mowthorpe Dale and Gilla Leys, Castle Howard, fruiting (Spruce, 1841).

Fruiting 9-10 mths.

Neckera Hedw.

1. **N. complanata** (L.) Hueb.

Range 1-2.

On trunks of trees, walls, and rocks.

Common in similar situations to the preceding, ascending to the main limestone of Punchards Gill (Baker).

Cum Hag Wall and other places about the Castle Howard Woods (Spruce, 1841).

Amongst the eastern hills, near Goathland, and in the glens and tributaries of the Esk, near Whitby (M.B.S.).

Fruiting 11-12 mths.

2. **N. crispa** (L.) Hedw.

Montane B. Xerophilous Range 1-3.

On calcareous rocks in hilly districts, sometimes on trees.

Common upon rocks and walls amongst the calcareous hills on both sides of the central valley ascending from the Magnesian Limestone to the limestone pavement of Cam Fell and Widdale Fell (Baker).

Amongst the eastern arenaceous hills in the upper part of Farndale (Mudd).

North wall of Lord Morpeth plantation, Castle Howard (Spruce, 1841).

Holwick Scars, Teesdale, fruiting; also at Easington and near Saltburn (Barnes).

Fruiting 11-4 mths.

Var. **falcata** Boul.

Face of cliff near the White Horse, Kilburn (W. Ingham, 1897).

3. **N. fontinaloides** (Lam.) Lindb.*N. pumila* Hedw.

Range 1-2.

On trunks of trees in shaded woods, rare.

In Holwick Woods, Upper Teesdale, and in the Howardian tract in Ray Wood, and Gilla Leys Wood, Castle Howard (Spruce, 1843).

In Balderdale, also near Kisdon Force, in Upper Swaledale, fruiting (Barnes).

Fruiting 10-11 mths., not common.

Sect. 2.—METEORIEÆ.

Climacium W. et M.1. **C. dendroides** (L.) W. et M.

Range 1-3.

In boggy or marshy places.

Common in wet places ascending from the central valley to the upper zone peaks, rarely fruiting (Baker).

Terrington Carr, Castle Howard, with fruit (Spruce, 1842).

Near Hackness, Scarbro', with fruit (Ibbotson).

Codhill Slack, Guisbro' Moor, with fruit (Barnes, 1867).

Fruiting 11-2 mths., not frequent in fruit.

Fontinalis (Dill.) L.1. **F. antipyretica** L.

Range 1-2.

In rivulets and stagnant waters, not infrequent.

Common in streams in the low country and amongst the hills ascending to the plateau of Holwick Fell (Baker).

Crambe Beck Stream, Castle Howard, and near York (Spruce, 1838).

Fruiting 6-7 mths.

2. *F. gracilis* Lindb.

(*F. antipyretica* var. *gracilis* Schmpr.)

On stones and rocks in alpine streams, rare.
Swinner Gill, Upper Swaledale (Barnes, 1897).
Fruiting 6-7 mths., rarely.

3. *F. squamosa* L.

Montane B. Range 1-2.

In mountain rivulets, rare.

In Teesdale, in the Tees from Upper Cronkley downwards.
On the east in Baysdale Beck. In the Esk below Castle-
ton, and in Bilsdale Beck at Laskill Bridge (Baker).

Saltergate Beck (Anderson, 1875).

Fruiting 6-7 mths., rarely found fruiting,

(Sect. 3.—**CRYPHÆEÆ**).

Antitrichia Brid.1. *A. curtispindula* (L.) Brid.

Montane B. Range 1-3.

On rocks, walls, and trees.

Frequent upon rocks and trees amongst the hills ascend-
ing from the side of the Leven, at Stokesley, to the main
limestone of Widdale Fell and Mickle Fell (Baker).

Old walls and trees near Castle Howard, sterile (Spruce).

Near Hawnby (Wheldon).

Near Keld, Upper Swaledale, and in Holwick Wood,
Teesdale, in fruit (Barnes).

Fruiting 4 mth., rarely fruiting.

Leucodon Schwæg.1. *L. sciuroides* (L.) Schwæg.

Range 1-2.

On trunks of trees, and on walls and rocks.

Common upon trees, and occasionally on walls in the low country, and amongst the hills, mostly sterile (Baker).

Fruiting 11 mth., very rarely fruiting.

Cryphæa W. et M.

1. **C. arborea** (Huds.) Lindb.

(*C. heteromalla* Hedw.)

Range 1.

On trunks of trees, rare.

Upon trees in the low country, in several places. Nea Croft, Thirsk, Carlton in Cleveland, Egton Bridge, and Ampleforth (Baker).

On Beech trees near Castle Howard, and on trees in Eskdale side, near Whitby (Spruce, 1842).

Fruiting 6-9 mths.

Hedwigia Ehrh.

1. **H. albicans** (Web.) Lindb.

(*H. ciliata* Dicks.)

Montane B. Range 1-2.

On rocks in exposed hilly districts.

In Teesdale, on the scars from Cronkley eastwards to Lonton. Amongst the eastern arenaceous hills on rocks and walls in several places; Loundsdale, Houlsike in Eskdale, Ladhill Gill, Osmotherley, and on the basaltic ridge over Great Ayton (Baker).

Near White Force, Upper Teesdale (Spruce, 1843).

Fruiting 3 mth.

The SPHAGNACEÆ or PEAT MOSSES.

In connection with this group of plants, reference must be made to "The Sphagnaceæ or Peat Mosses of Europe and North America" (1880), by Dr. R. Braithwaite, F.L.S., a treatise on this distinct family of plants, in which are excellent descriptions and figures of all the species then known, and which should be consulted by all students. We quote a few remarks from this work :—

"The plants constituting the family Sphagnaceæ, and known as Peat-mosses or Bog-mosses, have long attracted notice from the ordinary observer by their peculiar aspect and habit, and have equally interested the microscopist by the beauty of their tissues, and exercised the botanist by the difficulty which attends their correct determination ; the latter perhaps increased by the great variability of some species, and the uncertainty of the characters relied upon by various authors for the purpose of specific distinction."

With regard to the function of these plants in the formation of Peat, Professor Schimper says :—"Unless there were Peat-mosses, many a bare mountain ridge, many a high valley of the temperate zone, and large tracks of the northern plains would present an uniform watery flat instead of a covering of flowering plants or shady woods. For just as the *Sphagna* suck up the atmospheric moisture and convey it the earth, do they also contribute to it by pumping up to the surface of the tufts formed by them, the standing water which was their cradle, diminish it by promoting evaporation, and finally also by their own detritus, and by that of the numerous other bog plants to which they serve as a support, remove it entirely, and thus bring about their own destruction. Then as soon as the plant-detritus formed

in this manner has elevated itself above the surface water, it is familiar to us by the name of Peat, becomes material for fuel, and all *Sphagnum* vegetation ceases."

"Their power of retaining moisture renders them useful to the gardener in the cultivation of orchids, and ferns and other delicate plants, and for their package and transport in a fresh state.

"To the inquiring mind the study of the structure of these plants must prove an unfailing source of instruction, for in no members of the vegetable kingdom do we find means so well adapted to the ends they serve, as in the beautiful and varied tissues which build up a single stem of *Sphagnum*."

In the *Journal of Botany* for 1900, there is an article on the European Sphagnaceæ after Warnstorf, by **E. Charles Horrell**, F.L.S., in which he explains the difference of the European workers on these plants since the publication of Dr. Braithwaite's monograph issued in 1880, by D. Bogue, 3, St. Martin's Place, London, W.C.

He says the main difference between Warnstorf's system and that in general use in this country is due to the great importance ascribed in Warnstorf's system:—

1. To the position and form of the chlorophyll cells as seen in the transections of the branch leaves.
2. To the form and distribution of the *pores* on the walls of the hyaline cells of the branch leaves, and to a less extent of the stem leaves.

In this article, which is commenced in the April number of *Journal of Botany* for 1900, and continued each month until concluded in the December number, there is given a list of the various treatises on these plants issued since the publication of Braithwaite's monograph in 1880.

The entire list of the species of Europe are given as 50, according to Warnstorff's system, with a very great number of varieties in some of the more widely spread species, with a short diagnosis of each.

Braithwaite's monograph is the first in the list, and many of the varieties included in the monograph are given specific claims.

20 species only are given by Braithwaite, in which several varieties are included.

Since the publication of Dr. Braithwaite's monograph in 1880, several students of these interesting plants have been working at them, and by their kind aid I have been able to enumerate 29 species of Sphagnums that have been discovered in North Yorkshire, as well as numerous varieties to some of the most widely distributed species.

Sphagnum Dill.

Sec. A. CYMBIFOLIA.

1. *Sphagnum cymbifolium* (Ehrhr.) Hedwig.

Range 1-3.

Peat bogs and wet marshes, common upon swampy heaths, ascending from the central vale to the peak of Mickle-fell (Baker).

Strensall Common (Spruce).

Saltergate and Randy Mere, Egton (Anderson).

Var. *fusco-flavescens* Russ.

Darnholme Goathland (Anderson).

Saltergate Beck (Braithwaite).

Tees side below High Force (Wheldon).

Cronkley Pastures, Teesdale (Horrell).

Var. *carneum* Warnst.

Pilmoor (Ingham).

Cronkley Pastures, Teesdale (Horrell).

Var. *congestum* Schimp.

Strensall Common (Ingham).
Near Osmotherley (Wheldon).

Var. *squarrosulum* N. Hsch.

Strensall Common (Ingham).
Saltersgate (Anderson).

Var. *glaucescens* Warnst.

Mickle Fell, Farndale, near Gormire, Askham Bog, and
Strensall Common (Wheldon).
Roseberry Topping (Horrell).
Cronkley Fell, Teesdale (Horrell).
Stockton Forest and Pilmoor (Ingham).

Var. *glauco-pallens* Russ.

Saltersgate Beck (Anderson).
Strensall Common and Pilmoor (Ingham).
Cronkley Fell, Teesdale (Horrell).

Var. *pallescens* Warnst.

Saltersgate Beck (Ingham).
Penhill (Wheldon).
Goathland (Horrell).
Cronkley Pastures Teesdale (Horrell).

Var. *flavo-glaucescens* Russ.

Cronkley Fell, Teesdale (Horrell).

Var. *fuscescens* Warnst.

Cronkley Pastures, Teesdale (Horrell).
Fruiting 7-8 mths.

2. *Sphagnum papillosum* Lindb.

Range 1-2.

In peat bogs, mostly in the drier parts of the bogs, and
on sub-alpine heaths.

Darnholme, Goathland (Braithwaite and Anderson).

Strensall Common and Kilburn (Ingham).
 Stockton Forest near York (Stabler).
 Mickle Fell, Osmotherley and Penhill (Wheldon).

Var. **confertum** Lindb.

Near Gormire Lake, Thirsk (M.B.S.).
 Strensall Common (Ingham).
 Seamer Moor and Penhill (Wheldon).

Var. **normale** Warnst.

Roseberry Topping (Horrell).
 Mickle Fell and Osmotherley (Wheldon).
 Rolston Scarr, Strensall Common, and near Goathland
 (Ingham).
 Cronkley Pastures, Teesdale (Horrell).

Var. **sublæve** Limpr.

Darnholme Goathland (Boswell).
 Strensall Common, Hurst Moor, Arkengarthdale, and
 Baugh Fell (Ingham).
 Mickle Fell, Teesdale (Horrell).
 Fruiting 7-8 mths.

3. **Sphagnum medium** Limp.

(*S. cymbifolium* var. **purpurascens** *Braithwaites'* Exsic.).

Range 2-3.

Wet peat bogs, rare, or overlooked.
 Bogs on moor near Blueberry Gill.
 Goathland (Braithwaite 1860).
 On Widdy Bank Fell in Upper Teesdale (Horrell).
 Leckby Carr, 1898 (Ingham).

Var. **glauco-purpurascens** Russ.

South of Goathland, on wet land (Ingham, 1902).

Var. **purpurascens** W.

South of Goathland as above (Ingham).
 Mickle Fell, Teesdale (Horrell).

Var. **roseo-pallescens** W.

Mickle Fell (Jones and Horrell, 1901).

Var. **glaucescens** W.

Cronkley Fell (Jones and Horrell, 1901).

Var. **roseum** W.

Cronkley Fell (Jones and Horrell, 1901).

Var. **fuscescens** Warnst.

Mickle Fell, Teesdale (Horrell).

Var. **obscurum** Warnst.

Langdon Beck, Teesdale (Horrell).

Var. **versicolor** Warnst.

Cronkley Fell and Mickle Fell, Teesdale (Horrell).

Fruiting rarely.

4. **Sphagnum centrale** Jensen.

Range 1.

Sandy, peaty commons.

Strensall Common near York, 1880 (J. A. Wheldon).

5. **Sphagnum imbricatum** (Hornsch.) Russ.(S. *Austini* Sull. var. *imbricatum* Lindb.).

Range 2.

Peat moors.

Osmotherley Moors, 1883 (Wheldon).

Common in Upper Teesdale (Horrell).

In large deep hummocks.

Var. **cristatum** Warnst.

Mickle Fell, Teesdale (Horrell).

6. **Sphagnum turfaceum** Warnst.

Osmotherley Moor, 1879.

Near Gormire Lake, Thirsk, 1889 (J. A. Wheldon).

Mickle Fell, Teesdale, rare (Horrell).

Sec. **SQUARROSA.**7. **Sphagnum squarrosum** Persoon.

Range 1-3.

About boggy springs and shady sides of moorland streams.

Frequent on swampy heaths both in the low country and amongst the hills (Baker).

Terrington Carr, Castle Howard (Spruce).

Eskdale Side Moor and Goathland (Anderson).

Guisbro' Moor, Codhill bog, and by the Rye near Hawnby (Barnes).

Arncliffe Wood, Eskdale (Anderson, 1871, and Ingham).

Upper Teesdale, rare (Horrell).

Askham Bog near York and Strensall Common (Ingham).

Var. **laxum**, Braithwaite.

In ditches in the old Alum works at Eskdale, near Whitby (Anderson).

Var. **sub-teres** Lindb.

Saltersgate Moor (Anderson).

Var. **imbricatum** Schimp.

Roseberry Topping (Horrell).

Var. **spectabile** Russ.

Osmotherley Moor and Askham Bog (Wheldon).

Arncliffe Wood, Eskdale (Ingham).

Mickle Fell, Teesdale (Jones and Horrell).

Fruiting 8.

8. **Sphagnum teres** Angstr.

Range 1-2.

Deep marshy moors, boggy borders of lakes in sub-alpine districts.

Amongst the eastern hills by the Rye, near Hawnby and in Codhill bog (Barnes).

Common in Upper Teesdale, always barren (Horrell).

Var. *imbricatum* Warnst.

On the east Saltersgate bog (Boswell).

Eskdale (Anderson).

Near Goathland, among heather (Ingham).

On the West Cronkley Pastures, Teesdale, 1901 (Jones and Horrell).

Var. *sub-squarrosum* Warnst.

Cronkley Pastures, Teesdale (Horrell).

Fruiting 8.

Sec. **RIGIDA.**9. *Sphagnum compactum* D.C.

Range 1-2.

Marshy heaths and moorlands

Not uncommon upon damp moors, Addleburgh, Pilmoor, Stockton Forest, Ayton Moor, Sleights Moor, Hambleton Hills, Easterside, Terrington Carr, &c. (Baker).

Upper Teesdale, rarely fruiting (Horrell).

Strensall Common (Ingham).

Wheeldale Beck, Goathland (Anderson).

Var. *squarrosum* Russ.

Darnholme, Goathland (Anderson).

Strensall Common (Ingham).

Seamer Moor (Wheldon).

Var. *imbricatum* Warnst.

Strensall Common, Hackness, and South of Goathland (Ingham).

Seamer Moor, Easterside near Hawnby (Wheldon).

Levisham (G. Webster).

Sleights Moor (Rev. J. F. Crouch).

Cronkley Fell, Teesdale (Horrell).

Var. *sub-squarrosum* Warnst.

Strensall Common (Wheldon).

Aislaby Moor (G. Webster).

Fruiting 7-8.

Sec. CUSPIDATA.

10. *Sphagnum cuspidatum* Russ. and Warnst.

Range 1-3.

Stagnant pools in moorlands, frequent. Common in turf bogs and upon swampy heaths from the central valley to the peak of Mickle Fell (Baker).

Stockton Forest, near York, and Arncliffe Wood, Eskdale, near Whitby (Spruce).

Strensall Common (Ingham).

Saltergate (Anderson).

Var. *submersum* Schimp.

Osmotherley Moors, Seamer Moor, Mickle Fell, Strensall Common, and Penhill (Wheldon).

Top of Rowlston Scarr, near Hambleton (Ingham).

Var. *falcatum* Russ.

Penhill (Wheldon).

Cronkley Fell, Teesdale (Ingham).

Var. *plumosum* Nees and Hornsch.

Osmotherley Moors (Wheldon).

Levisham (G. Webster).

Fruiting 7-8.

11. *Sphagnum molluscum* Bruch.

(*S. tenellum* Ehrh.).

Range 1-3.

On wet moors, frequent.

In the central vale on Stockton Forest and Strensall Common, near York (Spruce).

In Swaledale, upon the southern spur of Rogan's Seat, and in Cleveland on Guisbro' Moor (Baker).

Near Goathland and Rosedale (M.B.S.).

Pilmoor, and on Cronkley Fell, Teesdale (Barnes).

Saltergate Beck, and near Hackness (Ingham).

Var. *compacta* W.

Strensall Common; Seamer Moor; and Cronkley Fell (Wheldon).

Fruiting 5-6 mths.

12. *Sphagnum recurvum* Russ. and Warnst.

(*S. intermedium* Hoffm.).

Range 1-2.

Moorlands, wet heaths, and spongy mountain bogs. Randymere, Egton, and Eskdaleside Moor, near Whitby, 1875 (Anderson).

Strensall Common (Wheldon and Ingham).

Plentiful in Upper Teesdale, always sterile (Horrell).

Leckby Carr (Ingham).

Saltergate (Anderson).

Var. *pulchrum* Lindb.

Wheeldale Moor, Goathland (Anderson).

Guisbro' Moor (Barnes).

Var. *amblyphyllum* Warnst.

North west shoulder of Baugh Fell, also south of Goathland, in abundance, partly submerged (Ingham, 1902).

Coverdale (Wheldon).

Var. *mucronatum* Warnst.

Arncliffe Wood, 1901. On the north west shoulder of Baugh Fell, and near Saltergate, nearly 2 ft. long, fruiting (Ingham, Aug. 1902).

Seamer Moor, and Penhill (Wheldon).

Cronkley, and Mickle Fell, Teesdale (Horrell).

Fruiting 7-8 mths, rarely.

13. *Sphagnum parvifolium* Warnst.

Range 2.

Similar to previous one.

On the north west shoulder of Baugh Fell, by the Rawthey river (Ingham, Aug. 1902).

Cronkley Pastures, and Mickle Fell, Teesdale (Horrell).

Sec. SUBSECUNDA.

14. *Sphagnum subsecundum* Limpr.

Range 1-2.

Wet heaths and ditches.

Frequent, upon swampy moors ascending to the plateau of Holwick Fell (Baker).

Strensall Common, and in boggy heaths near Goathland (M.B.S.).

Cronkley Fell, and Seamer Moor (Wheldon).

Stockton Forest, near York (Stabler).

Randymere; Egton; and Sleights Moor, near Whitby (Anderson).

Fruiting 6-8 mths.

15. *Sphagnum contortum* (Schultz) Limpr.(*S. laricinum* Spruce M.S.S.).

Range 1-2.

Deep peat bogs, rare.

Terrington Carr, Castle Howard, 1849 (Spruce).

Gathered in the same Carr, June, 1875 (Slater and Anderson).

Randymere, Egton, near Whitby, and Goathland (Anderson).

Fruiting 7-8 mths., rarely.

16. *Sphagnum crassycladum* Warnst.*(S. subsecundum* var. *auriculatum* Lindb.).

Range 1-2.

Moorland pools, generally submerged, rare.

Eskdale old alum works, near Whitby (Anderson).

Penhill, and near Gormire Lake, Thirsk (Wheldon, 1902).

Fruiting 7-8 mths., rarely.

17. *Sphagnum obesum* Warnst.

Range 1-3.

Submerged, or floating in moorland pools, not common.

Stockton Forest, near York (Spruce).

Darnholme, Goathland (Anderson),

Ayton Moor, Cleveland (Barnes).

Fruiting 6-8 mths., rare.

18. *Sphagnum inundatum* Warnst.

Range 1-2.

Submerged, or in very wet places in moorland pools.

On Pilmoor, completely submerged, and of varied colour (Ingham, 1901).

On Sandburn Common, and south of Goathland, partly submerged (Ingham, 1902).

Cronkley Fell, Teesdale (Horrell).

Fruiting 7-8 mths., very rarely.

19. *Sphagnum Gravetii* Warnst.

Range 1-2.

In boggy pools.

In thick iron water by Taith's Gill, Baugh Fell, also on high moorland south of Goathland (Ingham, 1902).

Fruiting, very rarely.

20. *Sphagnum rufescens* Warnst.

Range 1-3.

Submerged in moorland pools, sometimes in bogs or dripping rocks.

Darnholme, Goathland (Anderson).

By the side of the road, south of Goathland, a yellow and brown form.

On wet land, south of Goathland, a green form with all branches terete (Ingham, 1902).

Osmotherley Moor, Farndale, Penhill, and Mickle Fell (Wheldon).

Sleights Moor (Anderson).

Roseberry Topping (Horrell).

Cronkley and Mickle Fell, Teesdale (Horrell).

Fruiting, rarely.

Sec. *ACUTIFOLIA*.21. *Sphagnum fimbriatum* Wilson.

Range 1-2.

Shady swamps and lowland wet heaths, not common.

In the central vale on Towthorpe Moor near York. Terrington Carr and Thortle Wood, Castle Howard (Spruce, 1840).

On the east at Kildale, Flazendale, and near Highcliff (Baker).

Black plantation near Richmond (Ward).

Eskdaleside moor and Randymere, Egton (Anderson).

Pilmoor and Gurtof Gill (Barnes).

Strensall Common (Ingham).

Var. *robustum* Braithwaite.

Osmotherley Moor with fruit (Wheldon).

Var. *tenue* Grav.

Saltersgate Beck (Ingham).

Var. **compactum** Warnst.

Foot of Mickle Fell, Teesdale (Wheldon, 1883).

Fruiting 6-7 mth.

22. **Sphagnum Girgensohnii** Russ.*(S. acutifolium* Var. *strictum* Lindb.).

Range 2-3.

Shallow bogs upon sub-alpine moors and heaths, not common.

Near Caldron Snout, Teesdale (Anderson and Slater, 1853).

Cronkley Gill, Eskdale, and Saltersgate Beck (Anderson).

Richmond out moor and Codhill bog, Guisbro' Moor (Barnes),

Cronkley and Mickle Fell, Teesdale (Horrell).

Var. **stachyoides** Russ.

Cronkley pastures, Teesdale (Jones and Horrel, 1901).

Var. **hygrophilum** Russ.

Cronkley Fell (Jones and Horrell, 1901).

Var. **cristatum** Russ.

Cronkley pastures (J. & H., 1901).

Var. **xerophilum** Russ.

Mickle Fell (J. & H.).

Var. **spectabile** Russ.

Cronkley pastures (J. & H., 1901).

Var. **coryphœum** Russ.

Cronkley pastures (Horrell).

Fruiting 7 mth.

23. **Sphagnum Russowii** Warnst.

Range 2-3.

Peat bogs amongst the hills.

Saltersgate Beck (Anderson).

Common in Upper Teesdale (Horrell).

Var. **virescens** Russ.

Penhill (J. A. Wheldon, 1902).

Cronkley Fell, Teesdale (Horrell).

Var. **rhodochroum** Russ.

Cronkley Fell, Teesdale (Jones and Horrell, 1901).

Var. **flavescens** Russ.

Cronkley and Mickle Fell (Horrell).

Var. **pœcillum** Russ.

Cronkley Fell (Horrell).

Fruiting, very rarely.

24. **Sphagnum quinquefarium** Warnst.

Range 2-3.

Peat bogs on the higher hills.

High Cliff, Guisborough (Barnes).

Var. **fuscoflavum** Warnst.

White Force, Teesdale (Ingham).

Var. **roseum** Warnst.

Cronkley pastures (Jones and Horrell, 1900).

Var. **pallido-viride** Warnst.

Penhill (J. A. Wheldon, 1902).

Var. **pallescens** Warnst.

Cronkley pastures (Horrell).

Var. **virescens** Warnst.

Cronkley pastures (Horrell).

Fruiting 7-8 mth.

25. **Sphagnum fuscum** Klìnggr.

Range 2-3.

Peat swamps amongst the higher hills.

Var. **fuscescens** Warnst.

Cronkley Fell, Teesdale (Wheldon, 1883).

Cronkley Fell, Teesdale (Jones and Horrell, 1901), growing amongst *Sphagnum rubellum*.

Fruiting 7-8 mth.

26. *Sphagnum molle* Sullivant.

Range 1-2.

Peaty moors in the hills and by moorland streams, rare. Darnholme, Goathland, first gathered there by S. Anderson, 1853.

Wheeldale Beck (Braithwaite and M.B.S.).

Near Hawnby, Bilsdale (Barnes).

Var. **tenerum** Braithwaite.

Darnholme, Goathland (Braithwaite).

Gurtoff Gill and Leckby Carr (Barnes).

Fruiting 6-8 mth.

27. *Sphagnum subnitens* Russ. and Warnst.

(*S. acutifolium* Var. *laterivens*, Braithwaite).

Range 1-2.

Wet bogs in the lowland and amongst the hills.

Darnholme and Carrs Beck, Goathland (Braithwaite).

Abundant in Upper Teesdale, and fruiting freely (Horrell).

Var. **flavescens** Warnst.

Cronkley Fell, Teesdale (Jones and Horrell, 1901).

Strensall Common, and on the north-west shoulder of Baugh Fell (Ingham).

Var. **virescens** Warnst.

Cronkley Fell (Jones and Horrell).

Under dripping water in Arncliffe Wood, Eskdale, and by Saltersgate Beck (Ingham).

Coverdale (Wheldon).

Var. *violascens* Warnst.

Strensall Common, 1884. Cronkley Fell, fruit, 1882.
Seamer Moor, 1889. Penhill, 1902 (J. F. Wheldon).
Saltersgate Beck (Ingham).

Var. *purpurascens* Schlieph.

Cronkley Pastures, Teesdale (Horrell).
Fruiting 7-8 mths.

28. *Sphagnum acutifolium* Ehrh.

Range 1-3.

Heaths and bogs. Abundant, forming large cushions, ascending from the central valley to the peak of Mickle Fell (Baker).

Towthorp Moor and Stockton Forest, near York, Callidge Wood, and Terrington Carr (Spruce, 1838).

Var. *deflexum* Schimpr.

Sleights Moor near Whitby, and Darnholme, Goathland (Anderson, 1876).

Moor between Greenfell and Lunedale Tarn (Barnes, 1880).

Var. *purpureum* Schimpr.

Randy Mere, Egton, Whitby (Anderson).

Var. *arctum* Braithwaite.

Strensall Common (Ingham).

Var. *flavo-rubellum* Warnst.

Near Goathland, and by the side of Upper Cross, Haw Beck, Baugh Fell, Farn Gill, Arkengarthdale (Ingham).

Cronkley Pastures, Teesdale (Jones and Horrell).

Var. *viride* Warnst.

Strensall Common, and Hurst Moor, Arkengarthdale, by the Strid, Bolton Woods, and in the east by side of road in Beedale, near Scarbro' (Ingham).

Foot of Mickle Fell, Teesdale, and Penhill (Wheldon).

Var. *versicolor* Warnst.

Near Goathland, Strensall Common, and Little Punchard Gill, Arkengarthdale (Ingham).

Cronkley Pastures, Teesdale (Jones and Horrell).

Var. *tenue* Braithwaite.

Blueberry Gill, Goathland (Anderson).

Gartoff Gill, Boltby, Thirsk and Easby Moor (Barnes).

Var. *patulum* Schimpr.

Darnholme, Goathland (Braithwaite).

Strensall Common (Ingham).

Var. *luridum* Hueb.

Darnholme, Goathland (Crouch).

Near Maze Beck, Teesdale (Barnes).

29. *Sphagnum rubellum* Wilson.

Range 1-3.

Heaths and bogs, ascending from the central valley to the high western peaks (Baker).

Stockton Forest near York (Spruce, 1847).

South west from the High Force Inn, Teesdale, on the Yorkshire side of the river (Baker).

Near Caldron Snout (Anderson and M.B.S., 1853).

Among the eastern hills, damp places on Black Moor (Baker).

Wheeldale, Goathland (Anderson, 1871).

Lecky Carr (Ingham).

Var. *purpurascens* Warnst.

Cronkley Fell, Teesdale (Ingham and Wheldon).

Var. *rubrum* Grav.

Cronkley Pastures (Jones and Horrell).

Mickle Fell and Tees-side, below High Force, Osmotherley Moors, and Farndale (Wheldon).

(*Form robusta* Warnst.

Cronkley Fell (Wheldon, 1883).

South of Goathland (Ingham).

Var. **versicolor** Russ.

South of Goathland, also in Tarn Gill, Arkengarthdale (Ingham).

Var. **violaceum** Warnst.

Near Ellerbeck, Goathland (Ingham, 1902).

Var. **viride** Wavnsst.

Penhill (Wheldon, 1902).

Var. **pallescens** Warnst.

Cronkley Fell, Teesdale (Wheldon, 1894); (Jones and Horrell, 1901).

Fruiting 7-8 mths.

APPENDIX TO MOSSES.

Dicranella secunda Swartz. Lindb.

Lockwood Beck (Barnes).

Barbula Hornschuchii Schultz.

Near Gormire Lake, Thirsk (Barnes).

Fissidens osmundoides (Swartz.) Hedw.

Ladhill Gill, Hawnby (Barnes).

Mollia brachydontia (Bruch.) Lindb.

Var. *Cophocarpa*.

Addelburgh, Wensleydale (Barnes).

Stereodon subrufus (Nees.) Lindb.

Orthothecium intricatum Br. Schrp.

Ladhill Gill, Hawnby (Barnes).

Sphagnum molle Sullivant.

Ladhill Gill, Hawnby (Barnes).

Stereodon incurvatus (Schrad.) Mitt.

Near Richmond (Barnes).

HEPATICÆ.

(LIVER-WORTS OR SCALE MOSSES.)

The "*British Jungermania*," published 1816, by Sir W. J. Hooker, is one of the best monographs of these plants that was ever written up to that date, and contains beautiful drawings illustrating all the species (81) then known in the British Isles. This fine work gave an impetus to the study of these, many of them minute plants, which are so well represented in this country.

Sir James Edward Smith's "*English Flora*," vol. 5, 1844, contains class 24, Cryptogamia, by Sir W. J. Hooker. Part 1 contains the Hepaticæ, which are included in six genera; there are five genera in the Marchantia group which have thalloid growth, viz., *Riccia*, *Sphærocarpus*, *Anthoceros*, *Targionia*, and *Marchantia*, with twelve species, all the others are included by Hooker in the genus *Jungermania* in two divisions. 1. *Foliaceous*, with 74 species (all having distinct stems and leaves). 2. *Fronlose*, with 7 species. This work contains the excellent descriptions, without the fine drawings, from the earlier monograph of Hooker, which is now a scarce and expensive book.

In this section of the **Bryophyta** the first separation of plants from a thalloid growth to those with distinct stems and leaves takes place. Hooker, however, subdivided the large genus *Jungermania* L. into several sections. Some subsequent writers on these plants have largely increased the number of genera, many of which correspond to Hooker's sections of the single genus, *Jungermania*.

Dr. Taylor, of Dunkerroom, co. Kerry, Ireland, was one of the early students of the Hepaticæ, and was a co-worker with Hooker in publishing the "*Muscologia Britannica*,"

Hook. & Tay. He also studied the Hepaticæ, and living in the south-west corner of Ireland, in which district some of the rarest of the Hepaticæ grow, he became an authority on them, and examined and named a number of specimens sent to him, collected by the early travellers in New Zealand and other countries. Taylor however, followed Hooker by including all the foliose Hepaticæ in the genus *Jungermania*.

Dr. Taylor died at Dunkerroon in 1848. He was M.D., Dublin, also F.L.S., 1814, and Professor of Botany, Cork Scientific Institution; see "*Biographical index of British and Irish Botanists, Britten and Boulger.*"

Richard Spruce visited Ireland in July, 1842, and stayed three weeks with Dr. Taylor, made several excursions with him, and collected many of the rare Hepaticæ. He also looked over Dr. Taylor's fine herbarium, in which were many specimens of Exotic Mosses and Hepatics, from which he probably gained his first knowledge of the tropical mosses, and afterwards became such an illustrious explorer.

Spruce began his bryological studies in 1836, and was one of the most accurate observers in working out the Hepaticæ of Yorkshire. Some lists of these are given in the *Phytologist*, in which he gave some accounts of his early botanical excursions. In 1843 he visited Teesdale, and the result of this excursion is a paper:—" *The Musci and Hepaticæ of Teesdale,*" published in the transactions of the Edinburgh Botanical Society, of which he was a fellow. An enumeration of 41 Hepaticæ is given, collected by him in Teesdale. The accurate description of *Jungermania Bantriensis*, Hook, MSS. given, clearly distinguished the plant from *J. bidentata* L. In May, 1845, Spruce went to the Pyrenees, and occupied himself for ten months in the exploration of a portion of that chain of mountains. His account of this excursion:—" *The Musci and Hepaticæ of the Pyrenees,*" is published in the transactions of the Edin-

burgh Bot. Society, vol. 3, 1849. In this excellent treatise, no less than 387 mosses are enumerated, and the whole put in a natural arrangement into 35 tribes. His Pyrenean collection of Hepaticæ amounted to 92. These are arranged for the first time in any British publication, under the more modern generic names adopted in the "Synopsis Hepaticarum by Dr. Gottsche, Lindenberg, and Nees, 1844."

The account of this tour in the Pyrenees contains some critical observations on the distribution of Pyrenean Musci and Hepaticæ according to the zones of elevation in which he collected his plants; these are very good, and well deserve the careful consideration of all students. After his return from the Pyrenees in April, 1846, he settled himself at Welburn near Castle Howard, when he carefully examined and arranged his fine gathering of plants, comprising both Phanerogams and Cryptogams, and issued mounted named sets of specimens, amongst which some new species are described, and careful observations made on others not well known. Spruce remained at Welburn until 1849, when he started on his great exploring expedition to the tropical region of South America. He landed at Para at the mouth of the great river Amazon in July, 1849, and did not return to England until 1864.

For a short notice of his travels, see "*Voyage de Richard Spruce dans l'Amerique equatoriale pendant les années 1849-1864.*" This is written by the author himself, in the French language, and published in the *Revue Bryologique*, 1886, No. 4, pages 61 to 79. Spruce returned to England a confirmed invalid, suffering from an attack of paralysis which had seized him when exploring the Peruvian Andes in 1860, from which he never recovered his bodily strength, and during the remaining years of his life he was never able to take active outdoor exercise.

He returned to Yorkshire in 1866, coming to the village of

Welburn, from whence he had set off on his great exploring travels in 1849, bringing with him the large collection of Hepaticæ gathered through the great valley of the Amazon river and its tributaries, also from the equatorial district of the Peruvian Andes almost to the line of perpetual snow.

Although he was so much an invalid from his bodily infirmities as only to be able to work at the microscope for short intervals, he commenced the careful examination of these plants, many of them very minute, and requiring the most accurate observation ; fortunately, his mental power had not suffered from the paralysis, and by careful living his life was prolonged, and he was thus enabled to complete the examination of his collections, and the results were published in the transactions of the Botanic Society of Edinburgh, vol. xv., 1884, entitled :—“ *Hepaticæ Amazonicæ et Andinæ*,” 22 tab. with drawings of some new genera and species. The great scientific value of this work is in the limitation of the genera and their arrangement according to natural affinity. He has brought together a large amount of matter that has enabled him to draw valuable conclusions, and to take an eminent place among all systematists in this special branch of science, by the solidity and accuracy of his work, by his broad views, and by the original, independent and intelligent carrying out of his investigations. His classification of the Hepaticæ is so excellent that it has been much appreciated by all students, and his arrangement of them is now the one generally followed by all recent writers. Numerous scientific societies have done him honour. In his early life, Spruce was made a Fellow of the Botanical Society of Edinburgh, and on his return to England after his long travels, the great value of his work was realised. The degree Ph.D. was conferred upon him by the University of Zurich, and he was elected a Fellow of the Royal Geographical Society, and an Associate of the Linnean Society of London.

In the London Journal of Botany, vol. v., 1876, there is published an original article "*On Anomoclada, a new genus of Hepaticæ, and on its allied genera Odontoschisma and Adelanthus.*"

In 1882 a treatise of 96 pages was printed for the author at Malton entitled, *On Cephalozia (a genus of Hepaticæ) its sub-genera and some allied genera,*" by Richard Spruce, Ph.D., &c.

The above two publications should be consulted by all students of the Hepaticæ, for in them the author very clearly gives his original views, on the arrangement of the Hepaticæ, which he eventually more fully developed in his important work, "*Hepaticæ Amazonicæ et Andinæ.*"

In the Revue Bryologique, No. 6, 1881, there is an excellent article on "*Marsupella Stableri n. sp. and some allied species of European Hepaticæ,*" by Dr. Spruce, in which is given an account of the first attempt to break up the genus Jungermania of Rupp and Linneus by Raddi, in Italy, 1820, and afterwards by S. Gray in his "*Natural Arrangement of British Plants,*" London, 1821.

In 1865 Dr. M. C. Cooke issued in Science Gossip an easy guide to the *British Hepaticæ*, with numerous wood engravings. Afterwards, in 1894, he published *Handbook of the British Hepaticæ*, with 7 plates and 200 woodcuts from his previous issue in Science Gossip.

The late Benjamin Carrington, M.D., F.L.S., studied the Mosses and Hepatics. He visited the South-west of Ireland in 1861, where he stayed eleven weeks to recruit his health. During his visit he occupied much of his time in collecting the Mosses and Hepatics of that rich district. The results appeared in an interesting paper, "*Gleanings amongst the Irish Cryptogams,*" published in the Transactions of the Botanical Society of Edinburgh, with two plates, vol. vii., 1863. Afterwards, in 1875, he commenced a work on the

British Hepaticæ, to be issued in monthly parts. Of this however, owing to ill health and other circumstances, only four parts were issued, containing descriptions of thirty species, with drawings of fifty-one species.

In 1878 Dr. Carrington and Mr. W. H. Pearson of Manchester, who was a great friend and pupil of Dr. Carrington, and had collected with him in various districts, issued Four Fasciculi of the British Hepaticæ, *Hepaticæ Britannicæ exsiccatae*. *Fas. 1*, issued in 1878, contains specimens *No. 1 to 75*. *Fas. 2*, 1879, *No. 76 to 150*. *Fas. 3*, 1883, *No. 151 to 215*. *Fas. 4*, 1890, *No. 216 to 290*. All the specimens in these Fasciculi are named, and the localities given, with the collector's name. These are of great value and assistance to students, for comparison with any they may collect. Good drawings of these, with magnified figures of dissections, are a great help in determining these plants, a correctly named specimen, however, is invaluable for comparison.

Mr. Pearson is a very energetic worker, and after the death of Dr. Carrington he began to arrange his notes and drawings of the British Hepaticæ. He also corresponded with and visited the late Dr. Spruce, who at that time was engaged on his fine work, *Hepaticæ Amazonicæ et Andinæ*. Dr. Spruce, who was pleased to be able to help a careful worker, advised and encouraged him to go on with it, which resulted in the issue of the "*Hepaticæ of the British Isles, with figures and descriptions of all then known British species, by William Henry Pearson*," Lovell, Reeve & Co., London, 1902.

This work was issued in monthly parts, and completed in two volumes. Vol. 1, text. Vol. 2, figures, with drawings of magnified dissections of all the species. Vol. 2 contains 228 plates, with the drawings of one species only on each plate, after the manner of Hooker's early work.

A list, with descriptive notes of all the species of Hepaticæ hitherto found in the British Islands, was issued in Sept., 1902, by the Rev. H. W. Lett, M.A., M.R.I.A., rector of Aghaderg, Co. Down, Ireland. This is a very comprehensive list, and contains some few additional species not noticed in Mr. Pearson's work. It contains, however, no drawings. The descriptions are clear, and the most important characters which distinguish each species are printed in italics in the text, which is a great help. Good figures, however, are almost indispensable as a help to discriminate these, many of them minute plants, good engravings add much to the cost of such a work. Mr. Lett's work was issued at the price of 7/6, and is a very useful assistance to students. 243 species included in 61 genera are described in it.

Mr. S. M. Macvicar of Moidart, West Inverness, is doing good work in Scotland, adding new discoveries to the species of Hepaticæ known in our Islands.

The *Hepaticæ of Moidart* were given in a paper in the Journal of Botany, August, 1889, and a *Key to the British Hepaticæ* was published by him in the same periodical for May, 1901.

The district in which Mr. Macvicar resides, on the South-west coast of Scotland, has a remarkably mild and moist climate, which has enabled many of the rare Hepatics that grow in the South-west of Ireland around the Killarney Lakes to have also their habitat in the district around Moidart.

Mr. D. Macardle of the Glasnevin gardens, Dublin, has studied the Hepaticæ, and collected a good many in various districts of Ireland, and many of his discoveries are given in the Scientific Proceedings of the Royal Dublin Society. The Royal Irish Academy and the Irish Naturalist from 1881 to 1891, in which are useful notes to any students who

may desire to have a ramble in the Emerald Isle to collect and study these beautiful gems of the vegetable kingdom.

Report on Irish Hepaticæ, published in the Proceedings of the Royal Irish Academy, by David Moore, Ph.D., F.L.S., &c., 1876, is also a good work of reference for the Hepaticæ of Ireland.

The "Hepaticæ of the British Isles," by W. H. Pearson, 1902, is the most complete work on these plants, with good figures of all the species then known. The author has followed the arrangement proposed by the late Dr. Spruce, to whom, he says in the preface of his work, I am indebted for the description of most of the genera.

The following list of the North Yorkshire Hepaticæ is arranged on the plan of Mr. Pearson's work, who has adopted the Conspectus of Dr. Spruce, of which I give an outline of the arrangement, with the list of North Yorkshire species following, so far as I have been able to see specimens.

CONSPECTUS HEPATICARUM (*Spruce*).

SUB-ORDER I.—JUNGERMANIACEÆ.

TRIBE I.—JUBULEÆ.

- Genus 1. *Frullania*, *Raddi*. 5 species. British.
 „ 2. *Jubula*, *Dum.* 1 species. British.
 „ 3. *Lejeunea*, *Libert.* 14 species. British.

TRIBE II.—JUNGERMANIÆÆ.

SUB-TRIBE I.—RADULEÆ.

- Genus 1. *Radula*, *Dum.* 7 species.

SUB-TRIBE II.—PORELLEÆ.

- Genus 1. *Porella*, *Dill.* 5 species.
 * „ 2. *Pleurozia*, *Dum.* 1 species.

SUB-TRIBE III.—PTILIDIÆ.

- *Genus 1. *Anthelia*, *Dum.* 2 species.
 * „ 2. *Herberta*, *Gr. & Bennett.* 1 species.
 * „ 3. *Mastigophora*, *Nees.* 1 species.
 „ 4. *Blepharozia*, *Dum.* 2 species.
 „ 5. *Trichocolea* (*Dum.*) *Nees.* 1 species.
 „ 6. *Blepharostoma*, *Dum.* 1 species.
 „ 7. *Chandonanthus*, *Mitten.* 1 species.

SUB-TRIBE IV.—TRIGONANTHÆ.

- Genus 1. *Lepidozia*, *Dum.* 5 species.
 „ 2. *Bazzania*, *Gr. & Ben.* 4 species.
 „ 3. *Kantia*, *Gr. & Ben.* 3 species.
 „ 4. *Cephalozia*, *Dum.* 20 species.
 (Arranged in 3 Sub-genera. 1. *Eucephalozia*, *Spruce.*
 2. *Odontoschisma*, *Dum.* 3. *Cephaloziella*, *Spruce*).

- *Genus 5. *Prionolobus*, *Spruce.* 1 species,
 * „ 6. *Pleuroclada*, *Spruce.* 2 species.
 „ 7. *Hygrobiella*, *Spruce.* 1 species.
 * „ 8. *Eremonotus*, *Lindb. & Kaalas.* 1 species.
 * „ 9. *Adelanthus*, *Mitten.* 1 species.

SUB-TRIBE V.—SCAPANIOIDÆ.

- Genus 1. *Scapania*, *Dum.* 17 species.
 „ 2. *Diplophyllum*, *Dum.* 4 species.

SUB-TRIBE VI.—EPIGONEANTHÆ.

- Genus 1. *Lophocolea*, *Dum.* 4 species.
 * „ 2. *Clasmatocolea*, *Spruce.* 1 species.
 „ 3. *Chiloscyphus*, *Dum.* 2 species.
 „ 4. *Harpanthus*, *Nees.* 2 species.
 „ 5. *Mylia*, *Gr. & Ben.* 2 species.
 „ 6. *Pedinophyllum*, *Lindb.* 1 species.
 „ 7. *Plagiochila*, *Dum.* 7 species.

Genus 8. *Liochlaena*, *Nees*. 1 species.

* ,, 9. *Jamesoniella*, *Spruce*. 1 species.

,, 10. *Jungermania*, *L.* 36 species.

(Arranged in 7 Sub-genera. 1. *Aplozia*, *Dum.* 2. *Gymno-colea*, *Dum.* 3. *Lophozia*, *Dum.* 4. *Sphenolobus*, *Lindb.* 5. *Anastrepta*, *Lindb.* 6. *Cephaloziopsis*, *Spruce.* 7. *Anastrophyllum*, *Spruce*).

Genus 11. *Nardia*, *Gr. & Ben.* 5 species.

(In 2 Sub-genera. 1. *Eucalyx*, *Lindb.* 2. *Eunardia*, *Lindb.*).

Genus 12. *Marsupella*, *Dum.* 8 species.

,, 13. *Cesia*, *Gr. & Ben.* 9 species.

(In 2 Sections. 1. *Homocraspis*, *Lindb.* 2. *Eu-cesia*, *Lindb.*).

*Genus 14. *Acrobolbus*, *Nees*. 1 species.

* ,, 15. *Saccogyna*, *Dum.* 1 species.

SUB-TRIBE VII.—FOSSOMBRONIEÆ.

Genus 1. *Fossombronia*, *Raddi.* 6 species.

,, 2. *Scalia*, *Gr. & Ben.* 1 species.

,, 3. *Petalophyllum*, *Gottsche.* 1 species.

,, 4. *Pallavicinia*, *Gr. & Ben.* 3 species.

,, 5. *Blasia*, *Mich.* 1 species.

,, 6. *Pellia*, *Raddi.* 3 species.

SUB-TRIBE VIII.—METZGERIEÆ.

Genus 1. *Ancura*, *Dum.* 6 species.

,, 2. *Metzgeria*, *Raddi.* 4 species.

SUB-ORDER II.—MARCHANTIACEÆ.

Genus 1. *Marchantia*, *March. fil.* 1 species.

,, 2. *Conocephalus*, *Neck.* 1 species.

,, 3. *Reboulia*, *Raddi.* 1 species.

,, 4. *Preissia*, *Corda.* 1 species.

,, 5. *Lunularia*, *Mich.* 1 species.

- *Genus 6. *Dumortiera*, *Nees*. 1 species.
 * „ 7. *Targionia*, *Mich.* 1 species.
 * „ 8. *Sphærocarpus*, *Mich.* 1 species.

SUB-ORDER III.—RICCIACEÆ.

- Genus 1. *Riccia*, *Mich.* 8 species.
 „ 2. *Ricciella*, *Braun.* 1 species.
 „ 3. *Ricciocarpus*, *Corda.* 1 species.

SUB-ORDER IV.—ANTHOCEROTACEÆ.

- Genus. *Anthoceros*, *Mich.* 3 species.

The Conspectus includes the names of all the genera of which species are found in the British Isles, a total of 59 genera, with 277 species described and figured in the Hepaticæ of the British Isles. Sixteen of the above genera marked * are not represented in Yorkshire so far as our present knowledge extends. Subsequent workers, who live in the localities amongst the hills, in which are fine moist glens with shelter, the habitats where these plants abound, may be able to make additions to the list of Yorkshire Hepaticæ.

ORDER HEPATICÆ.

SUB-ORDER I.—JUNGERMANIACEÆ.

TRIBE I.—JUBULEÆ.

FRULLANIA, Raddi.

(*Jungermania*, Hooker).

1. *Frullania dilatata* (L.) Dum.

Trunks of trees frequent, often in orchards and near villages.

Trees in the neighbourhood of Castle Howard frequent (Spruce).

Trees near Thirsk, Guisbro', and Ayton (Baker).

Trees in the neighbourhood of Malton, also very fine fruiting at Hayburn Wyke, near Scarbro' (M.B.S.).

On trees at Sandburn (J. A. Wheldon).

Fruits winter and spring.

2. *Frullania Tamarisci* (Mich.) Dum.

(*Jungermania Tamarisci* L.)

On rocks also on trees in the hilly districts not unfrequent.

On rocks and about the base of tree trunks in Teesdale, also in the Castle Howard district (Spruce 1843).

Whitstoncliff, Hambleton, also High Cliff, Guisbro', and in Newton Dale among the Eastern hills (Baker).

Near Ayton in Cleveland (Mudd).

In Troutsdale, also on rocks near the Peak on the East coast, and at Kisdon Scar in Upper Swaledale (M.B.S.).

Peak Scar Gill, near Hawnby (J. A. Wheldon).

Fruits Summer and Autumn.

3. *Frullania fragilifolia* Taylor.

On trees in sub-alpine districts, rare.

On trees near Kisdon Force, Upper Swaledale (M.B.S. 1890).

Not found in fruit, which is very rare.

[1. *Jubula Hutchinsiæ* (Hook.) Dum.

(*Frullania*, Hook.)

This rare Hepatic has not hitherto been met with in North Yorkshire.

In West Yorkshire it was first gathered near Hebden Bridge on stones in streams (by J. Needham 1896).

It was afterwards met with near a waterfall in Ravensgill, Pateley Bridge, Nidderdale (Oct., 1897, by J. L. Cocks).

Fruits Summer.]

LEJEUNEA, LIBERT.*(Jungermania, Hook).*(Sec. *Eu-Lejeunea*, Spruce).1. ***Lejeunea serpyllifolia***, (Dicks.) Lib.

On trees and moist shaded rocks in the hilly districts not common.

In Teesdale near the High Force, Hell Cleft, and in other places, but nowhere abundant (Spruce, 1843).

In Eskdale near Whitby, and on trees in Mowthorpe-dale, Castle Howard (Spruce, 1842).

In Baysdale Cleveland (Mudd.), Cronkley gill Eskdale near Lealholm on rocks, also in Beckdale Helmsley on trees (M.B.S.)

Var. ***planiuscula*** Pearson. Near Sedburgh, Redmire, (Ingham).

Fruits Spring and Summer.

2. ***Lejeunea patens***, Lindberg.

On the stems of trees or bushes in moist shaded glens, rare.

Saltergate Beck, Newton dale in the Eastern hills (S. Anderson, 1875).

Fruits Spring and Summer.

(Sec. *Drepano—Lejeunea* Spruce).

3. ***Lejeunea hamatifolia*** (Hook.) Dum.*(Jungermania hamatifolia* Hook).

On rocks in shaded moist glens amongst the western hills, rare.

Bracken Ghyll Dentdale near Sedburgh (G. Stabler, 1877), growing with *L. calcarea*.

This locality is in West Yorkshire.

Fruits Spring.

(Although there is no distinct record of this plant in North Yorkshire it is very likely to be met with in some of the gills of Upper Swaledale and Nidderdale).

(Sec. *Colo*—*Lejeunea* Spruce).

4. *Lejeunea calcarea* Libert.

On wet rocks in shaded glens amongst the hills, rare.

On the Yorkshire side of the High Force, on limestone rocks in Hell Cleft and by Ettersgill Beck, Teesdale (Spruce, 1843).

Kisdon Scarr, near the Force, Upper Swaledale (M.B.S., 1890). Sleightholme Beck, near Bowes (Ingham).

Near Keld, Richmond, Whitfield gill and Mill gill (Barnes).

Fruits Spring and Summer.

5. *Lejeunea Rossettiana*, Massalongo.

(*Jung. hamatifolia* var. β *echinata* (Hook in *Supt. Brit. Hepaticæ*.)

Moist shaded glens amongst the hills, growing sometimes with the previous one, rare.

On shaded limestone rocks near Kisdon Force, Upper Swaledale (R. Barnes, 1890), also near Rokeby and Howstean Beck (Barnes).

Fruits Spring and Summer.

(Sec. *Micro*—*Lejeunea* Spruce).

6. *Lejeunea ulicina* Taylor.

On the stems of trees and shrubs in moist shaded glens, rare.

Saltergate Beck, Newton dale (S. Anderson, 1876).

Fruits Spring and Summer.

TRIBE II.—JUNGERMANIÆ.

SUB-TRIBE I.—RADULÆ.

Radula, Dum. (*Jungermania*, Hook.)

1. **Radula complanata**. (L.) Dum.

On trunks of trees not uncommon.

In Gilla Leys wood and other Castle Howard woods (Spruce 1839).

In the Central Vale on trees, also on trees in the western dales, and in shady woods amongst the Eastern hills (M.B.S.).

Near Thirsk and at Ayton in Cleveland (Baker).

On trees in the neighbourhood of Whitby (Anderson).

Arncliffe wood, Eskdale, and Whitfield Gill, near Bowes (Ingham).

Fruiting Spring and Summer.

SUB-TRIBE II.—PORELLEÆ.

Porella Dill, (*Madotheca*, Dum.)

(*Jungermania*, Hook.)

1. **Porella lævigata** (Schrad.) Lindb.

(*Madotheca lævigata*, Dum.)

On rocks in hilly districts, rare.

Mowthorpe Dale, Castle Howard (H. Ibbotson and G. Stabler).

Blea Beck, Teesdale (Baker).

Ingleby, Cleveland (Mudd).

Very rarely fruiting.

2. **Porella platyphylla**. (L.) Lindb.

(*Madotheca platyphylla*, Dum.)

On walls, rocks and sometimes on trunks of trees not uncommon in the hilly districts.

On rocks in Teesdale, at Whitstoncliff, and near Ganthorpe, Castle Howard (Spruce, 1843).

Kirkdale, near Kirby Moorside, with perianths (Spruce, 1847).

Near Riveaulx and on rocks above Gormire, also in Wensleydale amongst the western hills and in Newton Dale in the eastern hills (Baker).

Mowthorpe Dale, Castle Howard (M.B.S.).

Ruswarp near Whitby (Braithwaite).

Castle Hill, Scarbro', and Hawnbly in Bilsdale (J. A. Wheldon).

Rowlston Scar, Helmsley, Reeth and Sedburgh (Ingham).
Very rarely fruiting.

3. *Porella rivularis* (Nees) Lindb.

(*Madotheca rivularis*, Nees.)

On rocks in shaded glens amongst the hills, rare.

Banks of the Greta and in Hagg Syke, Teesdale (M.B.S.)

Sleightholme Beck, near Bowes (Ingham).

Very rarely fruiting.

SUB-TRIBE III.—PTILIDIÆ.

Belpharozia Dum. (*Jungermania*, Hook.)

1. *Belpharozia ciliaris* (L.) Dum.

On sandy heaths in the vale of York ascending to the hills, not uncommon.

Sparingly on Cronkley Fell, Teesdale (Spruce, 1843).

Strensall Common, near York, amongst the heather (M.B.S.)

Saltergate Beck, and on most of the eastern moorlands (Anderson).

Westerdale moor, Cleveland (Mudd).

Sawdon moor (M.B.S.)

Seamer moor (J. A. Wheldon).

Very rarely fruiting.

2. **Blepharozia pulcherrima** (Hoff'm.) Lindb.*(Jungermania Hoffmanni, Walroth.)*

On trees in hilly districts, not common.

On a birch tree in the Park Quarry, Castle Howard, (Spruce, 1845).

Still growing on the same tree, and has spread to no other tree in the Park (M.B.S., 1898).

Near Gainford, on the Tees Yorkshire side, at Gurtoff gill, Boltby, High cliff, Guisbro', and near Hawnby in Bilsdale (R. Barnes).

Always sterile.

TRICHOCOLEA (Dum.) Nees.*(Jungermania Hook.)*1. **Trichocolea tomentella** (Ehrh.) Dum.

In damp shaded glens and on wet dripping rocks, &c., rare.

Gilla Leys wood, Castle Howard (Spruce, 1841).

Damp woods above Boltby Thirsk (Baker).

Saltergate in the Eastern hills (S. Anderson).

Fruiting very rarely.

BLEPHAROSTOMA Dum.*(Jungermania tricophylla, Hook.)*1. **Blepharostoma tricophylla** (L.) Dum.

Turfy heaths, and in moist shady places in woods amongst the hills, not uncommon.

Upper Teesdale abundant in moist situations, also by Goathland Beck (Spruce, 1884).

Arncliffe wood and Cronkley gill, Eskdale (M.B.S.)

Bank of the Greta (M.B.S.)

Near Bowes (W. Ingham).

Fruiting Spring.

(SUBTRIBE IV.—TRIGONANTHÆ.)

*(Eu—Lepidozia Spruce.)***Lepidozia** Dum. (*Jungermania* Hook.)1. **Lepidozia reptans** (2.) Dum.

In shady woods on heathy ground and on stones amongst moss frequent.

Cum Hagg, and Callidge wood, Castle Howard, fruiting abundantly (Spruce, 1842), also on Cronkley Scar, Teesdale, sparingly.

In Wensleydale and near Thirsk (Baker).

Near Ingleby in Cleveland (Mudd).

Arncliffe wood and Cronkley gill, Eskdale, and by streams at Goathland (M.B.S.)

Rigmill wood near Whitby, and at Saltersgate Beck (S. Anderson).

Near Hawnby in Bilsdale (Stabler and Slater, 1873).

Fruiting May and June.

2. **Lepidozia Pearsoni** Spruce.

In wet places in sub-alpine hills, rare.

Baugh Fell, gathered by W. Ingham, Aug. 1902, during the Y.N.U. excursion.

This is a dioicous species by which character it is well distinguished from the previous one. Fruit has not been found.

Sec. *Micro-Lepidozia* Spruce.

3. **Lepidozia setacea** (Web.) Mitten.*(Jungermania setacea* Hook.)

Bogs and wet ground in shaded places not uncommon.

Heathy places near Maize Beck and Cronkley Scar, Teesdale (Spruce, 1843).

Terrington Car Castle Howard, and on Strensall common in the vale of York (Spruce).

Blueberry Gill, Goathland (M.B.S.)

In Cleveland (Mudd.)

Saltergate Beck in the Eastern hills (S. Anderson).

Fruiting Oct. and Nov.

4. *Lepidozia trichoclados* (C. Müll.)

Wet hearthery ground amongst the hills probably not uncommon, overlooked as a form of *setacea*.

Blueberry Gill, Goathland, and Cars Beck, Wheeldale (M.B.S., 1876).

Cronkley Fell, Teesdale (N. West, 1888).

Strensall Common (W. Ingham, 1904).

This is a recent addition to the flora, and is not included in Pearson's British Hepaticæ, published 1902; it is a more slender plant than *L. setacea*, the perianth is very distinct.

Fruiting Oct. and Nov.

BAZZANIA, Gray & Benn.

(*Mastigobryum* Nees.) (*Jungermania* Hook.)

1. *Bazzania trilobata* (L.) Gr. & B.

Moist sub-alpine places amongst the hills, not common.

Arncliffe wood, Eskdale near Whitby (Spruce, 1847).

Hambleton Hills, and Killing Moor, Newton Dale (Baker).

Blueberry Gill, Goathland (M.B.S.)

Fruiting very rarely.

KANTIA Gray & B. (*Jungermania* Hook.)

(*Calypogeia* Raddi.)

1. *Kantia trichomanis* (L.) Gr. & B.

Moist ground on heaths, in woods and marshes, frequent.

In Teesdale, also in Terrington Car, and damp places, in many of the Castle Howard woods (Spruce, 1843).

On the eastern hills at Saltersgate beck, and Rigmill wood near Whitby (Anderson).

Blueberry gill, Goathland, and Arncliffe wood, Eskdale fruiting (M.B.S., 1876).

Peak Scar (J. A. Wheldon).

Fruiting Spring and Summer.

Var. *aquatica*, *Ingham M.S., Buckden Pike (Ingham).

2. *Kantia Sprengelii* (Mart.)

Similar localities to the previous one.

Strensall Common and Cum Hagg Wood, Castle Howard (Spruce, 1847).

Coneysthorpe banks wood and Mallyan Spout, Goathland (M.B.S.)

Coatham Marshes (Ingham).

Fruiting Spring and Summer.

3. *Kantia arguta* (Mont. et Nees). Lindb.

Wet marshy places, and on damp soft sandstone rock, not common.

Stockton Forest, near York (Spruce, 1843),

Broomfield House wood, Stainsacre near Whitby (Anderson, 1877).

Castle Howard, Park Quarry (G. Stabler).

Quarry on Olivers Mount, Scarbro'.

Near Mallyan Spout, and in Blueberry Gill, Goathland; also near Hawnby in Bilsdale (M.B.S., 1878).

Newton Dale near Levisham Station (M.B.S.)

Wheeldale (Ingham).

Growing plentiful near Saltburn (Barnes).

Not found with fruit.

* (See *Naturalist*, 1905, p. 171).

4. *Kantia submersa* Arnell.

Wet peat bogs, rare or overlooked.

Fen Bog, top of Newton Dale, in the eastern hills (W. Ingham).

A recent addition, not included in Pearson's British Hepatica.

Fruit not found.

CEPHALOZIA Dum.

(*Jungermania* Hook.) (*Eu-Cephalozia* Spruce).

1. *Cephalozia bicuspidata* (L.) Dum.

Damp places in woods, hedge banks, moist heaths, &c., frequent.

Abundant in the heathery tracts in the Central Vale, and also in moist places, amongst both ranges of hills, Gormire and Bleak Moor (Baker).

Seamer Moor (J. A. Wilson).

Var. *grandiflora* Spruce MSS.

Stockton Forest near York (Spruce, 1842).

Var. *condensata* Spruce MSS.

Sandy hill bridge, Castle Howard Park (Spruce).

Park Quarry, Castle Howard, and near Mallyan Spout, Goathland (M.B.S.)

Fruiting Spring and Summer.

(This very widely distributed plant varies much, and many forms are met with).

2. *Cephalozia Lammersiana* (Hueb.) Spruce.

(*Jung. bicuspidata* var. *uliginosa* Nees.).

In marshy, heathery ground, also on wet stones by streams in shaded glens amongst the hills, not uncommon.

In Eskdale, near the waterfall of the Mirk Esk, Goathland (Spruce, 1841).

Mount St. John, Thirsk (Baker).

Baysdale, Cleveland (Mudd).

Arncliffe wood, Eskdale, and Randy Mere, Egton, near Whitby (M.B.S.)

Carsbeck, Goathland (Anderson).

Var. *grandifolia* (Spruce MSS).

On dripping wet cliff in Arncliffe wood, Eskdale, near Egton Bridge (M.B.S., 1887).

Fruiting Spring and Summer.

3. *Cephalozia catenulata* Hueb.) Dum.

(*Jung. reclusa* Taylor).

On rotting wood, turfey banks and moist shaded sandstone rocks, not common.

Blueberry gill, Goathland (M.B.S., 1877).

Arncliffe wood, Eskdale (1897).

On Easby Moor, and on rotting tree trunks near Easington and Roxby wood, Cleveland (R. Barnes, 1891).

Fruiting Spring and Summer.

4. *Cephalozia pallida*, Spruce

Sandy heathery ground.

Strensall Common, near York (G. Stabler, 1897).

Arncliffe wood, Eskdale (M.B.S.)

Easby Moor (Barnes).

Fruiting Summer.

5. *Cephalozia lunulæfolia*, Dum.

(*Ceph. multiflora* Spruce.)

Wet banks in woods and moist heaths, not uncommon, especially amongst the hills on both sides of the central vale.

Cum Hagg Wood, Castle Howard (Spruce, 1842).

Guisbro' Beck (Baker).

Rigmill wood, near Whitby (Anderson).

Blueberry Gill, Goathland, fruiting very abundantly (M.B.S., 1876).

Also in Arncliffe wood, Eskdale.

Peak Scar (J. A. Wheldon).

Wheeldale, Ellerbeck, and by the Greta near Bowes (Ingham).

Fruiting Spring and Summer.

6. *Cephalozia connivens* (Dicks). Dum.

(*Blepharostoma connivens* Dum.)

On wet moors and peat mosses, mostly trailing amongst Sphagnum, not common.

Terrington Car, Castle Howard, amongst Sphagnum, Aulacomniun, &c. (Spruce, 1847).

Gathered in the same Car, May 1880 (M.B.S.)

Strensall Common (J. A. Wheldon).

Goathland Moor, and Carrs-beck, Wheeldale (M.B.S., 1876).

Pilmoor, Leckby Car and Wensleydale (R. Barnes).

Fruiting Spring and Summer.

7. *Cephalozia curvifolia* (Dicks). Dum.

(*Jung curvifolia* Dickson.)

On rotting tree-trunks, and soft sandstone rocks, rare.

Moatwood, Thirsk (Baker, 1851).

Recorded by R. Teesdale at Brimham rocks.

Blueberry Gill, Goathland, on a decaying oak trunk (G. Stabler, 1877), near the bottom of the Gill.

Found on sandstone rock, at the upper part of the same gill (Webster and Slater, 1889).

Easington Beck Cleveland, and Ravens gill, Nidderdale (Barnes).

Bready Gill, near Hackness (W. Ingham, 1904).

Fruiting Summer.

8. *Cephalozia Francisci* (Hook.) Dum.

On heathy moors near York, on sides of recently cut ditches in turfy soil, rare.

Langwith Moor and Stockton Forest near York (Spruce 1842).

Strensall Common (M.B.S. & G. Stabler, 1881).

Near Hawnby Bydale, and Lockwood Beck Cleveland (Barnes).

Fruiting Spring and Summer.

9. *Cephalozia fluitans* (Nees) Spruce.

(*Ceph. obtusiloba* Lindberg.)

In the wettest part of bogs, creeping upon *Sphagna* and other mosses, rare.

Cars-beck, Wheeldale, Goathland, and on Goathland Moor near Whitby (S. Anderson 1875).

Leckby Car, in fruit, with *Ceph. connivens* (R. Barnes, 1891).

Same Car (W. Ingham).

Fruiting Summer, rarely.

(For a good account of this plant see brochure on *Cephalozia*, by Dr. Spruce, printed at Malton for the Author, 1882).

(*Subgenus Cephaloziella* Spruce).

10. *Cephalozia divaricata* (Sm.) Dum.

(*Jungermania byssacea* Roth.)

On the ground on stones, on decaying wood, or over-running other Hepatics and Mosses, in a humid site not uncommon.

In Teesdale in several places, also on Stockton forest near York (Spruce 1843).

Castle Howard Park Quarry.

Var. **Starkii**.

Maizebeck, Teesdale (Spruce, 1843).
 Stockton Forest near York (Ingham).
 Fruiting Summer.

11. **Cephalozia leucantha** Spruce.

On rotting wood in damp places, rare.
 Coatham Marshes (Ingham).
 Fruiting Spring and Autumn.

(*Subgenus Odontoschisma* (Dum.) Spruce.)

12. **Cephalozia Sphagni** (Dicks.) Spruce.

(*Sphagnæcetis communis* Nees.)
 (*Jungermania Sphagni* Dicks.)

On moist heaths creeping over Sphagnum, Leucobryum,
 &c., common.

Towthorpe Moor near York, in fruit (Nov. 1837, Spruce).
 Strensall Common (M.B.S.)
 Cars-beck, Goathland (Anderson).
 Fruiting very rarely.

13. **Cephalozia denudata** (Nees) Spruce.

(*Jungermania denudata* Nees.)

On heathery ground and decaying stumps, with mosses
 amongst the hills, not common.

Strensall Common near York (Stabler, 1879).
 Blueberry Gill, Goathland (M.B.S., 1876).
 Fruiting very rarely.

HYGROBIELLA Spruce.1. **Hygrobrella laxifolia** (Hook.) Spruce.

(*Jungermania laxifolia* Hook.)

In moist places, on dripping rocks, by stream sides
 and near waterfalls amongst the hills, rare.

At the base of High Force, Teesdale, very scarce, also near waterfall in Goathland Beck (Spruce 1843).

Saltergate Beck and Eskdaleside Moor near Whitby (Anderson 1874).

Near Mallyan Spout, Goathland, with fine perianths (M.B.S., 1878.)

Upper Nidderdale, Slope Wath and near Guisbro' in Cleveland, with perianths (R. Barnes, 1891).

Fruiting Spring.

(SUBTRIBE V. SCAPANIOIDEÆ.

SCAPANIA Dum.

(*Jungermania* Hook.)

1. **Scapania æquiloba** Nees.)

Wet places amongst the hills, not frequent.

Near Winch Bridge, Teesdale, and Newton Dale in the Eastern hills (Spruce).

Mickle Fell Scar, Teesdale (Baker).

Holwick Scar, Teesdale (M.B.S.)

Fruiting rarely.

2. **Scapania aspera**, Müller & Bernet.

(*Scap. æquiloba* var. *dentata* Gottsche.)

Damp heaths in sub-alpine districts, not common.

Maize Beck, Teesdale (Spruce, 1843).

Askrigg Common and near Sedburgh (Ingham).

Fruiting very rarely.

3. **Scapania subalpina** (Nees) Dum.

(*Jungermania subalpina* Nees.)

On stones and rocks in damp glens, rare.

Deepdale near the Greta, Bowes (W. Ingham 1904).

Fruiting April and May.

4. *Scapania resupinata* (L.) Dum.*(Jungermania resupinata L.)**(Martinellia gracilis Lindberg.)*

Wet banks, and in woods in shaded rocky places amongst the hills, frequent.

Common in the Castle Howard district in damp shady places, and upon rocks near streams among the hills (Spruce).

Near Reeth (Ingham).

Blueberry Gill, Goathland, fruiting very finely (M.B.S., 1878).

Laskill Bridge, Bilsdale (J. A. Wheldon).

Fruiting Spring.

5. *Scapania nemorosa* (L.) Dum.*(Jungermania nemorosa L.)*

In shady woods and amongst wet rocks by streams, especially amongst the hills, not so common as the preceding species.

In Teesdale on rocks by streams, also amongst the eastern hills in Arncliffe wood, Eskdale, &c., and in the Howardian tract (Spruce 1843).

Hambleton hills and Bilsdale (Baker).

Battersby, Cleveland (Mudd.)

Saltergate Beck (M.B.S. 1853).

Var. *uliginosa* Jensen amongst the Eastern hills at Fen Bog (Ingham).

Fruiting Spring.

6. *Scapania undulata* (L.) Dum.*(Jungermania undulata L.)*

Wet places amongst rocks in streams and near springs, abundant, especially amongst the hills.

Maize Beck, Teesdale (Spruce 1843).

Near Battersby in Cleveland (Mudd).

Saltersgate Beck and Newton Dale (M.B.S.)

Eskdaleside Moor, near Whitby (Anderson).

Near High Force, Teesdale (J. A. Wheldon).

Var. *minor viridis* Spruce MSS.

Ash Hagg Gill, near Hackness, Scarbro' (M.B.S. 1884).

Fruiting Spring.

7. *Scapania purpurascens* (Hook.) Taylor, MSS.

(*Jungermania nemorosa*, var. *purpurascens*, Hook.)

On sandstone rocks, mostly by streams amongst the hills, and in shady damp woods, not uncommon.

In Teesdale, also in Raywood, Castle Howard (Spruce 1843).

By streams in Cleveland (Mudd).

In Saltersgate Beck, Blueberry Gill, Goathland, also in Arncliffe wood, Eskdale, and other tributary streams of the Esk, abundant (M.B.S.)

Near Reeth, Saltburn, Sedburgh and Bowes (Ingham).

Fruiting Spring and Summer.

8. *Scapania intermedia* Husnot.

On dry shaded sandstone rocks in Eskdale, near Whitby.

On shaded rocks, Little beck, Eskdale, also in Arncliffe wood (M.B.S.)

Widdy Bank, Teesdale (Ingham).

Fruiting Spring and Summer.

9. *Scapania irrigua* (Nees) Dum.

(*Scapania irrigua*, Nees.)

Wet bogs and heathery tracts amongst Sphagnum, rare or overlooked.

Base of Raywood wall, Castle Howard (Spruce 1843).

Strensall Common (G. Stabler).

Wet places amongst Sphagnum on the eastern moors
(M.B.S.)

Saltersgate Beck, and by the Greta near Bowes (Ingham).
Fruiting Spring, rarely.

10. *Scapania uliginosa* (Swartz) Dum.

(*Jungermania uliginosa* Swartz.)

In wet boggy places in the upper part of the moor
streams, not common.

Terrington Car, Castle Howard (Spruce 1841).

Near Battersby, Cleveland (Mudd)

In the upper part of the Goathland streams, and in
Saltersgate Beck (M.B.S.)

Wheeldale Beck (W. Ingham, 1904).

Fruiting rarely.

11. *Scapania curta* (Mart.) Dum.

(*Jungermania curta* Mart.)

Damp places in woods on stone, in shady places by
ditches and streams, rare or overlooked.

Sleights moor, near Whitby (Baker, 1856), sterile.

Saltersgate Beck (Ingham).

Fruiting Spring, rarely.

12. *Scapania umbrosa* (Schrad.) Dum.

(*Jungermania convexa* Scop.).

Damp rocks in shaded places in woods, and amongst the
hills on decaying tree stumps, not very common.

In Newton Dale and in Arncliffe wood, Eskdale, very
fine (Spruce, 1842).

Cum Hagg wood and in the Park Quarry, Castle Howard.

Rocks near Gormire, near Mallyan Spout, Goathland, and in Stainton Dale, near Scarbro' (M.B.S.)

By the Greta near Rokeby (Ingham).

Fruiting Spring, not common.

13. **Scapania rosacea** (Corda) Dum.

(*Jungermania rosacea* Corda).

On damp shady rocks, rare.

Yorkshire side of the Tees, near the High Force, Teesdale (Ingham) and near Winch Bridge.

Fruiting Spring, rarely.

DIPLOPHYLLUM Dum.

1. **Diplophyllum albicans** (L.) Dum.

(*Jungermania albicans* Hook.).

Moist banks and rocks in shady places, in woods, &c., very common everywhere, in the central vale and amongst both ranges of hills.

A very widely distributed plant, found in temperate latitudes in Europe and North and South America.

Fruiting Spring and Summer.

2. **Diplophyllum obtusifolium** (Hook.) Dum.

(*Jung. obtusifolia* Hook.).

On sandy heaths, rare.

Langwith Moor, near York (Spruce, 1842) (in East Riding).

Fruiting Spring.

3. **Diplophyllum Dicksoni** (Hook.) Dum.

(*Jung. Dicksoni* Hook.).

On damp rocks in sub-alpine places, rare.

Cronkley Scar and on rocks south-east of Cronkley Bridge, Teesdale, very scarce (Spruce, 1843).

Fruiting Summer.

(SUB-TRIBE VI.—EPIGONIANTHEÆ.)

LOPHOCOLEA Dum.*(Jungermania* Hook.).1. **Lophocolea cuspidata** Limp.

Moist shady banks in gills and woods, &c., not infrequent.

Coneysthorpe bank wood near Castle Howard, Little Beck, and in Arncliffe wood, Eskdale near Whitby, Ash Hagg Gill near Hackness, Scarbro' (M.B.S., 1884).

Fruiting Spring and Summer.

2. **Lophocolea bidentata** (L.) Dum.*(Jung. bidentata* Hook.).

Moist and shady situations, on hedge banks, particularly amongst moss, and about the base of trees, abundant both in the central vale and in the dales amongst the hills.

Plentiful in Teesdale, and in many of the Castle Howard woods (Spruce).

Rocks near Gormire and near Thirsk, also by banks of Swale (Baker).

In Cleveland (Mudd).

Eskdale and in the Whitby district, common (Anderson).
Troutdale, and by Goathland Beck (M.B.S.).

South Cliff, Scarbro' (J. A. Wheldon).

Var. **alata** Nees.

On Kirkham hill (Spruce 1847), and Stockton forest, near York, rare.

Fruiting Winter and Spring.

3. **Lophocolea heterophylla** (Schrad.) Dum.*(Jung. heterophylla* Hook.).

Moist places, on trunks of trees, and on decaying wood, abundant mostly in the low country.

In most of the Castle Howard woods, very abundant (Spruce).

On trees around Malton, common (M.B.S.)

Near Melmerby and Thirsk (Baker).

On trees near Grosmont (Anderson).

On trees Sandburn Common (J. A. Wheldon).

Near Kirkham, Strensall, Leckby Car, Healaugh (Ingham).

Fruiting Winter and Spring plentifully.

CHILOSCYPHUS Corda.

1. *Chiloscyphus polyanthos* (L.) Dum.

(*Jung. polyanthos* Hook.)

Moist and wet places and on stones by the sides of streams, not uncommon.

On stones on the bed of the Balder, Teesdale (Spruce, 1843).

By the stream above Boltby, Thirsk (Baker).

Near Battersby, Cleveland (Mudd).

On stones by the Esk in Arncliffe wood, Eskdale, near Whitby, very abundant (M.B.S.)

Near Grosmont (Anderson).

Fruiting Spring.

Var. *rivularis* Nees.

On wet rocks by the Esk in Arncliffe wood (M.B.S.)

2. *Chiloscyphus pallescens* (Schrad.) Dum.

(*Jungermania pallescens* Schrad.)

It wet places by ditches in shady woods, not common.

Kirkham Hill, also Ray Wood and Cum Hagg Wood, Castle Howard (Spruce, 1847).

Fruiting Spring.

HARPANTHUS Nees.1. **Harpanthus scutatus** (Web. & Mohr.) Spruce.*(Jungermania stipulacea* Hook.)

Shaded rocks in damp places, in woods amongst the eastern hills, rare.

On rocks in Arncliffe wood, and Cronkley Gill, Eskdale, near Whitby, in fine fruit (Spruce, 1847).

In Arncliffe wood (Stabler, 1880).

Near Mallyan Spout, Goathland (M.B.S., 1890).

Fruiting Summer and Autumn.

MYLIA Gray & B.1. **Mylia Taylori** (Hook.) Gray & Benn.*(Jung. Taylori* Hook.)

On moist heaths, in boggy places and on wet rocks, &c., in sub-alpine districts, not uncommon.

Cronkley Scar and the west side of Mickle Fell, Teesdale (Spruce 1843).

Stockton Forest.

Plentiful in wet places amongst the heather on the eastern moors near Saltersgate (Anderson & M.B.S.)

Saltersgate Beck (G. Stabler, 1874).

Leckby Car, Fen Bog and near Sedbergh (Ingham).

Fruiting very rarely.

2. **Mylia anomala** (Hook.) Gray & B.*(Jungermania anomala* Hook.)

In wet peat bogs, trailing amongst Sphagnum and other mosses, not uncommon.

Strensall Moor (Spruce, 1842), and Terrington Car, Castle Howard.

Randymere, Egton near Whitby (M.B.S.)

Goathland Moor (W. Ingham).

Fruiting very rarely

PEDINOPHYLLUM Lindb.I. **Pedinophyllum interruptum** (Nees.) Lindb.*(Plagiochila interrupta* Dum.)*(Jungermania interrupta* Nees.)

On wet rocks by streams, and near waterfalls amongst mosses and other Hepatics, rare.

Lythe Beck near Whitby (Spruce, 1841).

Near Thomason's Force, Goathland (M.B.S., 1878).

Var. **Pyrenaica** Spruce.

Near Redmire in Wensleydale (Ingham).

Fruiting Spring.

PLAGIOCHILA Dum.I. **Plagiochila asplenioides** (L.) Dum.*(Jung. asplenioides* Hook.)

Moist woods, on shady banks and among damp rocks, frequent.

In Scawton Howle, fruiting (Spruce, 1841).

Frequent in Teesdale on the low ground, scarcely ascending to the sub-alpine regions (Spruce, 1843).

In fine fruit in Raywood, Castle Howard (Spruce).

Aysgarth, Upton Gill, Wensleydale, and near Sutton, Thirsk, with perianths (Baker).

Castle Hill, Scarbro' (J. A. Wheldon).

In Cleveland (Mudd).

Saltergate Beck (Anderson).

Arncliffe wood, Eskdale near Whitby, fruiting (M.B.S., 1876).

Var. **Dillenii** Taylor.

Hambleton hills, and in Balderdale, Teesdale (Baker).

Forge Valley, Scarbro' (J. A. Wheldon).

Reeth, White Force Teesdale, Bowes, Kilburn (Ingham).

Fruiting Spring only, rarely.

2. **Plagiochila spinulosa** (Dicks.) Dum.*(Jung. spinulosa* Hook.)

Wet rocks in shady places, in sub-alpine districts, not frequent.

Near High Force and Caldron Spout, Teesdale, but rather rare (Spruce, 1843).

Blea Beck, Teesdale, (Baker).

Not found in fruit.

LIOCHLÆNA Nees.1. **Liochlæna lanceolata** (L.) Nees.*(Jung. lanceolata* Hook.)

Moist shady banks and on stones by streams, rare.

Wet rocks by the Esk, near Grosmont.

In Arncliffe wood, and in Cronkley Gill, Eskdale near Whitby (first discovered by Spruce, 1842).

Gathered in Arncliffe wood, Eskdale, April 1881 (M.B.S. & G. Webster).

Fruiting Spring.

JUNGERMANIA (L.)(SUB-GENUS I.—**APLOZIA** Dum.)1. **Jungermania riparia** Taylor.

Moist banks and on stones by stream sides, frequent, varying in size considerably.

Sides of streams in Teesdale (Spruce, 1843).

Wensleydale and Bilsdale (Baker).

Saltergate Beck (Anderson).

Near Richmond, near Mallyan Spout, Goathland, Arncliffe wood, Eskdale, and Mill Beck Valley, Robin Hoods Bay (M.B.S.).

Near Bowes, Sedberg, and Leyburn Shawl (Ingham).

Fruiting Spring and Summer.

2. *Jungermania pumila* With.*Aplozia pumila* Dum.

On stones in damp places under the shade of trees, and by stream sides, not so plentiful as the preceding.

On stones under trees in Castle Howard Park (Spruce).

In Coneysthorpe bank wood on stones, and in the Park Quarry, Castle Howard.

Near Mallyan Spout, Goathland, and in Arncliffe wood, Eskdale, near Whitby (M.B.S.)

Fruiting Spring and Summer.

3. *Jungermania cordifolia* Hook.*Aplozia cordifolia* Dum.)

Boggy places, and in springs in sub-alpine districts, not uncommon.

In streams on the west side of Mickle Fell, and on wet rocks near the Tees in various places (Spruce, 1843).

Cronkley and Holwick Scars, Teesdale (Baker).

Westerdale, Cleveland (Mudd).

Holwick Fell, Whitfield Gill (Ingham).

Fruiting Spring and Summer, very rarely.

4. *Jungermania sphærocarpa* Hook.*Aplozia sphærocarpa* Dum.

Wet rocks by sides of streams and in shady glens, not uncommon amongst the eastern dales.

Wet cliffs from Grosmont to Whitby (Spruce, 1842).

Saltergate Beck (Anderson, 1875).

High Cliff, Guisboro' (Baker).

Baydale, Cleveland (Mudd).

Blueberry Gill, Goathland, Little Beck, Eskdale, and in North Dale, Rosedale, with very fine fruit (M.B.S., 1886).

Near Mallyan Spout, Goathland, and Wheeldale Beck (Ingham).

Fruiting Spring and Summer.

Var. **nana**. Nees.

Blueberry Gill, Goathland (M.B.S.)

Var. **lurida** Dum.

Marske Mill, near Saltburn (Ingham).

Var. **Goulardii** Husnot.

Little Beck, Eskdale, and North Dale, Rosedale (M.B.S.).

(SUB-GENUS.—LOPHOZIA Dum.

(Sec. *Bidentes* Schiffn.)

5. **Jungermania incisa** Schrad.

(*Lophozia incisa* Dum.).

Wet boggy and springy places, not uncommon amongst the hills.

Near Maize Beck, Teesdale (Spruce, 1843).

Ayton Moor, Broughton bank, Cleveland (Mudd).

Near Mallyan Spout, Goathland (M.B.S.)

Reeth, Sedberg, and Arncliffe (Ingham).

Fruiting Winter and Spring, rarely.

6. **Jungermania barbata** Schreb.

(*Lophozia barbata* Dum.)

Rocks, in woods and damp heathy places, abundant amongst the hills.

Frequently intermixed with mosses, especially near the High Force, Teesdale. (Spruce, 1843).

White Force and Holwick Scar, Teesdale (Ingham).

Near Hambleton (Baker).

In Cleveland (Mudd).

Saltergate Beck and plentiful in Eskdale (S. Anderson).

Osmotherly (J. A. Wheldon).

Fruiting Spring, somewhat rare.

7. *Jungermania lycopodioides* Wallr.Var. *Floerkii* (Web. & Mohr.)*(Jung. Floerkii* Web. & Mohr.)

Damp rocks and walls, somewhat rare.

Near High Force, Teesdale (Wheldon).

Fruiting Spring, rarely.

8. *Jungermania gracilis* Schleich.*(Jung. attenuata* Lindenb.)

Rocks in sub-alpine places, not uncommon.

Teesdale (Spruce).

Boltby near Thirsk and High Cliff, Guisbro' (Baker).

Blueberry Gill, Goathland, on rocks (M.B.S.).

Saltersgate Beck (Ingham).

Fruiting Spring.

9. *Jungermania Lyoni* Taylor.*(Jung. quinquedentata* Web. & Mohr.)Rocks and heathy damp places in sub-alpine districts,
not uncommon.

Cronkley Fell and Holwick wood, Teesdale (Spruce, 1843).

Blea Beck (Baker).

Near Mallyan Spout and in Blueberry Gill, Goathland
(M.B.S.).

White Force and Holwick Fell, Teesdale (Ingham).

Fruiting Spring.

10. *Jungermania ventricosa* Dicks.*(Lophoria ventricosa* Dum.)Shady woods and damp banks, amongst heather, &c.,
abundant.Holwick Scar, and near Sedberg, Kilburn, Leckby Car,
and Ellerbeck (Ingham).

Wet places in Teesdale, on Strensall Common, Park Quarry, Castle Howard, near Gormire, Thirsk, Saltersgate Beck, and by streams at Goathland (M.B.S.)

Var. **minor** Nees.

Mallyan Spout, Goathland (M.B.S.)

Fruiting Spring and Autumn.

11. **Jungermania porphyroleuca** Dicks.

(*Jung. ventricosa* var. *porphyroleuca* Limp.)

Wet bogs and heathy ground, not common.

Terrington Car, Castle Howard, with perianths (Spruce, 1847).

Near Hayburh Wyke, Scarbro' (M.B.S., 1892).

On stone by the Derwent, near Kirkham (W. Ingham, 1898).

Fruiting Spring.

12. **Jungermania capitata** Hook.

(*Jung. intermedia* Lindenb.)

Moist banks and on rocks in old sandstone quarries, in shady places amongst the hills, not very uncommon.

In the Park Quarry, and near the new river bridge, Castle Howard, and on Strensall Moor, in the vale of York (Spruce).

In Troutsdale, and near Grosmont, growing intermixed with *Jung. bicrenata* (M.B.S., 1852).

Fruiting Spring.

13. **Jungermania bicrenata** Schmidel.)

(*Lophozia bicrenata* Dum.)

Sandy heaths and in damp places in old sandstone quarries, not very common.

Sand holes, Strensall Common, in fine fruit (Stabler & M.B.S., 1877).

January, 1906.

Near Grosmont and in Park Quarry, Castle Howard, fruiting abundantly (M.B.S.)

Fruiting Spring and Summer.

14. *Jungermania exsectiformis* Schmid.

Sandy heaths and moors, and old damp sandstone quarries, not abundant.

Strensall Common, near York (Spruce, 1842).

Stockton Forest, near York (Stabler & M.B.S., 1881).

Castle Howard Park Quarry, rocks near Gormire, and near Mallyan Spout, Goathland (M.B.S.)

Fruiting Spring and Summer, rarely.

15. *Jungermania Bantriensis* Hook.

(*Jung. bidentata* var. *Bantriensis* Hook.)

Moist banks by streams amongst the hills, not common.

On sandy deposits by the Tees and its tributary streams; abundant below Winch Bridge. Sides of springs on the summit of Cronkley Fell, Teesdale (Spruce, 1843).

Holwick Scarr, Teesdale, and by the Swale, near Richmond (M.B.S., 1853).

Boltby Bank, Thirsk, High Cliff, Guisbro' (Baker).

Var. *minor* Spruce.

By the Tees near Winch Bridge and High Force.

Var. *muscicola* Spruce.

On moist rocks below the High Force (Spruce).

Fruiting Spring and Summer.

(For an excellent description of this plant consult the paper on the Musci and Hepaticæ of Teesdale, by R. Spruce, pub. in trans. Edinboro' Bot. Soc. Vol. 2.)

16. *Jungermania Bantriensis* Hook.Var. *acuta* Lindenb.*(Lophozia acuta Dum.)*

Damp shady rocks, rare.

Under the New river bridge, Castle Howard (G. Stabler).

Fruiting Summer, rarely.

17. *Jungermania Bantriensis* Hook.Var. *Muelleri* Nees.*(Lophozia Muelleri Dum.)*

Damp rocks by streams or shaded places, rare.

White Force, Teesdale, and Banks of the Greta, near Bowes (Ingham).

Fruiting Spring, rarely.

*(Sec.—Gymnocolea Dum.)*18. *Jungermania inflata* Huds.

Moist heaths and peaty moors, frequent.

On heathy places in Teesdale, and on Stockton Forest, near York (Spruce, 1843).

Strensall Common, in fruit (Stabler & M.B.S.)

Near Mallyan Spout, Goathland, and in many other places, on wet heaths in the eastern moorlands, abundant (M.B.S.)

Seamer Moor (J. A. Wheldon).

Fruiting Summer, rarely.

*(SUB-GENUS.—GYMNOCOLEA Dum.)*19. *Jungermania turbinata* Raddi.*(Jung. affinis Wilson, and Jung. Wilsoniana Nees.)*

Frequent in limestone and marshy districts, in moist shaded places and old quarries.

Gilla Leys wood, Castle Howard (Spruce).

Guisbro' Beck (Baker).

Banks of the Greta, near Rokeby, abundant (M.B.S.).
 Little Beck, and wet banks by Cockmill Beck, near
 Whitby (Anderson).

Near Saltburn (Barnes).

Leyburn Shawl, Peak Scar, Semmerwater and near Bowes
 (Ingham).

Fruiting Spring and Summer.

(SUB-GENUS.—SPHENOLOBUS Lindb.)

20. **Jungermania minuta** Crantz.

(*Diplophyllum minutum* Dum.)

On shaded rocks in sub-alpine places, rare.

On rocks among mosses and other hepatics at the
 bottom of Blueberry Gill, Goathland (Anderson & M.B.S.).

Wood near Strensall Common (Ingham, 1904).

Fruiting Spring, rarely.

NARDIA Gray & Benn.

ALICULARIA Corda.

1. **Nardia crenulata** (Sm.) Carr.

(*Jung. crenulata* Sm. Hook.)

(*Aplozia crenulata* Dum.)

Moist sandy heaths and banks, not uncommon.

Langwith Moor and Strensall Common, near York
 (Spruce).

Goathland beck and Cars beck, Goathland (M.B.S.)

Wheeldale (Ingham).

Sleights Moor, near Whitby (Baker).

Strensall Common (G. Stabler, 1874).

Fruiting Spring.

2. **Nardia Genthiana** Hueb.*(Jung. gracillima Sm.)**(Aplozia gracillima Dum.)*

On damp sandy banks in shady woods, and amongst debris of old quarries, not uncommon.

High Cliff, Guisbro' (Baker).

Broughton bank, Cleveland (Mudd.)

Coneysthorpe bank wood, Thortle wood, and in the Park quarry, Castle Howard, fruiting very finely (M.B.S., 1879).

Fruiting Spring.

3. **Nardia hyalina** (Lyell) Carr.*(Jung. hyalina Hook.)*

Wet places by stream sides, and on rocks, plentiful in some of the eastern dales.

Common on stones by streams in Eskdale (Spruce, 1842).

Easterside, Bilsdale, and amongst the Hambleton hills (Baker).

Near Mallyan Spout, Goathland; Arncliffe Wood, Eskdale, and in Little Beck near Whitby (M.B.S.)

Greta near Bowes (Ingham).

Fruiting Spring.

4. **Nardia obovata** (Nees) Carr.*(Jungermania obovata Nees.)*

Wet places on rocks by streams in similar localities to the previous one, but not so common.

Guisbro' Moor (Mudd.)

Saltergate Beck (Anderson).

Troutsdale, Kildale beck, and Falling foss, Little beck near Whitby (M.B.S., 1884).

White Force, Teesdale (Ingham, 1879).

Fruiting Spring, rarely.

5. *Nardia compressa* (Hook.) Gray & B.

(*Mesophylla compressa* Dum.)

(*Alicularia compressa* Gotsche.)

In wet places on stones and near waterfalls in sub-alpine glens, rare.

Boltby glen, Thirsk (Baker).

Baysdale, Cleveland (Mudd.)

Blueberry Gill, Goathland, fruiting. Near Falling foss, Little beck, and on dripping cliff in Arncliffe wood, Eskdale near Whitby (M.B.S., 1897).

Fruiting Early Summer.

6. *Nardia scalaris* (Schrad.) Gr. & B.

(*Jung. scalaris* Schrad.)

Hedge banks and in damp places by road sides, on the moors amongst heather, common.

Frequent on moist sites in Teesdale, and on Stockton Forest near York (Spruce).

Osmotherley Moor, Bilsdale (Baker).

Ayton in Cleveland (Mudd.)

Saltergate Beck and Cars-beck, Goathland (Anderson).

Seamer Moor (J. A. Wheldon).

Fruiting Spring and Summer.

7. *Nardia silvrettæ* (Gottsche.)

(*Nardia geoscypha* Massalongo.)

(*Nardia hæmatosticta* Lindb.)

(*Alicularia minor* Limp.)

On wet sandy heaths, not common or overlooked.

Strensall Common growing with *N. scalaris* (G. Stabler, 1883).

Same locality (Ingham, 1897).

Hebden Valley near Scarbro' (Ingham, 1904).

Fruiting Spring and Summer.

MARSUPELLA Dum.

(*Sarcoscyphus p. p.* Corda.)

(*Nardia p. p.* (Gray.) Carr.)

1. *Marsupella ustulata* (Hueb.) Spruce.

On soft sandstone rock in shaded places, rare.

In the sandstone quarry in Castle Howard Park (Spruce, 1846).

Gathered in the same locality in fine fruit (M.B.S., 1889).

Fruiting Spring and Summer.

2. *Marsupella neglecta* (Limp.) Dum.

(*Sarcoscyphus neglectus* Limp.)

On shaded rocks of soft sandstone, rare or overlooked.

In the sandstone quarry, Castle Howard Park, with *Marsupella ustulata* (M.B.S., 1886).

Fruit not found.

3. *Marsupella emarginata* (Ehrh.) Dum.

(*Jung. emarginata* Ehrh.)

Wet places by stream sides and on rocks in the hilly districts, abundant.

Common in moist rocky situations, especially near streams in Teesdale, and in the Park Quarry, Castle Howard (Spruce, 1843).

Baysdale, Cleveland (Baker).

Goathland Beck, very abundant (M.B.S.)

Fruiting Spring.

Var. **aquatica** Lindenb.

Blueberry Gill, Goathland; Maize Beck and White Force, Teesdale (Ingham, 1897).

Var. **perpusilla** Spruce.

Holwick Wood, Teesdale, on stones (Spruce).

Park Quarry, Castle Howard, and Goathland (M.B.S., 1886).

Var. **pallida** Spruce MSS.

Newton Dale (Spruce, 1843).

Var. **robusta** Lindb.

Stream sides in Upper Teesdale (M.B.S., 1853).

Maize Beck, Teesdale (Spruce, 1843).

White Force, Teesdale (Ingham, 1897).

4. **Marsupella Pearsoni** Schiff.

Wet places near streams amongst rocks in sub-alpine districts, rare or overlooked.

White Force, Teesdale (Ingham, 1897).

Fruiting Summer, rarely.

CESIA Gray & Bennett.

(*Gymnomitrium* Corda.)

(*Jungermania* Lightf.)

1. **Cesia obtusa** Lindb.

Rare, on high alpine rocks over which water occasionally trickles.

Holwick Scar, Teesdale (Spruce, 1843).

Fruiting Summer.

(SUB-TRIBE VII.—FOSSOMBRONIEÆ.)

FOSSOMBRONIA Raddi.

(*Jungermania* Hook.)

1. **Fossombronia Dumortieri** Lindb.

Moist shaded banks, and on heathery tracts in boggy places, not common or overlooked.

Terrington Car, Castle Howard (Spruce, 1844).

Strensall Common (G. Stabler, 1875).

Very fine on Barmby Moor in the East Riding (J. J. Marshall).

Skipwith Common (W. Ingham); East Riding.

Fruiting Summer and Autumn.

2. **Fossombronina pusilla** (L.) Dum.

(*Jungermania pusilla* (L.)

Similar places to the previous one.

Holdgate near York (Spruce, 1841).

Near Hawnby, Bilsdale (G. Stabler, 1871).

Near Scarbro' (G. Webster, 1895).

Side of pool near River Foss, York (Ingham).

Strensall Common, Pilmoor (Ingham, 1898).

Fruiting Summer and Autumn.

3. **Fossombronina cristata** Lindb.

Wet places by stream sides, &c.

Langwith Moor near York (Ingham) East Riding.

Near Beverley in the East Riding (J. J. Marshall).

Fruiting Autumn, rare or overlooked.

SCALIA Gray & Benn.

(*Haplomitrium* Nees.)

1. **Scalia Hookeri** (Lyell.) Gray & Benn.

(*Jungermania* Hook.)

On sandy peat moors, very rare.

On Barmby Moor near Pocklington in East Yorkshire, fruiting (gathered by Spruce, Nov. 1842).

The only locality in the county where this rare hepatic has been found, and it has not been gathered since it was first discovered.

Fruiting Autumn, very rare.

PETALOPHYLLUM Gottsche.1. **Petalophyllum Ralfsii** (Wils.) Gottsche.

Damp flats on the coast, very rare.

On Coatham marshes, near Redcar, growing amongst *Pallavicinia Flotowiana* (W. Ingham, 1901).

Fruiting Spring.

PALLAVICINIA Gray.

(*Blyttia* Nees.)

(*Jungermania* Hook.)

1. **Pallavicinia Lyellii** (Hook.) Gray & Benn.

In moist ditches and peat bogs, rare.

Tees side below Winch Bridge (Spruce, 1843).

Saltergate Beck (S. Anderson, 1875).

Fruiting Spring and Summer.

2. **Pallavicinia Flotowiana** (Nees.) Lindb.

Wet bogs and sandy salt marshes near the coast, rare.

Coatham Marshes near Redcar, with fine perianths (W. Ingham, 1898).

Fruiting Spring and Summer.

This rare plant is found near Southport in Lancashire, amongst the marshy sand dunes on that coast, growing with it are some rare Bryums, which have also been found to grow with the *Pallavicinia* in the Coatham marshes on the east coast.

BLASIA Mich.

(*Jungermania Blasia* Hook.)

1. **Blasia pusilla**. L.

Moist heaths on sandy ground, by ditches occasionally inundated, and in damp places in shaded woods, not uncommon.

Clifton Ings near York (Spruce, 1841).

Mount St. John, near Thirsk (Baker).

Eskdale near Whitby (S. Anderson, 1874).

Mulgrave woods near Whitby (M.B.S.)

Askham bog near York, June 1900 (M.B.S.)

Fruiting Spring, very rarely.

PELLIA Raddi.

1. *Pellia epiphylla* (L.) Lindb.

(*Jungermania* (L.) Hook.)

Moist ground by ditch sides, and among stones by banks of streams, frequent.

Ganthorpe Broats, Gilla Leys, and in damp places in many of the Castle Howard woods, also near York (Spruce, 1841).

Saltergate Beck and near Mallyan Spout, Goathland, abundant (S. Anderson & M.B.S., 1876).

Forge Valley, Scarbro' (J. A. Wheldon).

(Many forms of this wide-spread plant are enumerated in Synop. Hep., the classical work of Gottsche, Lindenb., and Nees.)

Fruiting Spring.

2. *Pellia Neesiana* (Gottsche) Limpr.

In wet swamps and ditches, rare or overlooked.

Near Saltburn (Oct. 1890, M.B.S.)

Near Saltburn, found in fruit (R. Barnes, 1891).

On dripping rock, Arncliffe wood, Egton, male plant (W. Ingham, 1901).

Fruiting Spring.

3. *Pellia calycina* (Taylor.)

(*Jungermania endiviæfolia* Dicks.)

In similar places to the previous species, not so frequent.

Banks of Derwent near Kirkham Abbey, and Gilla Leys wood Castle Howard (Spruce, 1844).

By streams in Goathland, and in Howdale beck near Robin Hoods Bay (M.B.S.)

South Cliff, Scarbro' (J. A. Wheldon).

Strensall Common (Ingham).

Fruiting Spring and Summer.

(SUB-TRIBE VIII.—METZGERIÆ.)

ANEURA Dum.

(*Jungermania* Hook.)

1. **Aneura pinguis** (L.) Dum.

Bogs and wet places, abundant.

Near York and Kirkham Hill (Spruce, 1841).

Gilla Leys, Castle Howard, Arncliffe wood, Eskdale near Whitby (M.B.S.)

Rigmill Wood and Saltersgate Beck near Whitby (Anderson).

Coatham Marshes (Ingham).

Fruiting Summer.

2. **Aneura multifida** (L.) Dum.

(*Jungermania multifida* L.)

Wet marshy places, by ditches, &c., not uncommon.

Hell Cleft, Teesdale, and Gilla Leys wood, Castle Howard (Spruce, 1843).

Forge Valley near Scarbro'.

Near Robin Hoods Bay, and in Arncliffe wood, Eskdale near Whitby (M.B.S.)

Fruiting Spring.

3. **Aneura latifrons** Lindb.

(*A. palmata a major* Nees.)

On wet rocks and banks by streams, rare or overlooked.

Near Mallyan Spout, Goathland (M.B.S., 1876).

Fruiting Spring.

4. *Aneura ambrosioides* (Nees.)*(A. multifida* var. *ambrosioides* Nees.)

Wet places by ditches and near waterfalls, rare or overlooked.

Mallyan Spout, Goathland (Ingham).

Fruiting Spring.

5. *Aneura sinuata* (Dicks.) Dum. p.p.*(Jungermania sinuata* Dicks.)

In wet marshy places, not common or overlooked.

Callidge wood Castle Howard, and Kirkham hill (Spruce, 1841).

By side of pool, Strensall (W. Ingham, 1897).

Near Whitby (Dr. Carrington).

Fruiting Spring, rarely.

METZGERIA Raddi.1. *Metzgeria furcata* (L.) Radd.*(Jungermania furcata* L.)

On trunks of trees and bushes, abundant.

Scawton Howle near Helmsley, and on trees in Castle Howard woods (Spruce, 1841).

Near Goathland beck and on trees in Troutsdale, on trees in Beckdale, Helmsley (M.B.S., 1855).

Rigmill wood near Whitby (Anderson, 1876).

Var. *prolifera* Nees.

Ravenscar, Robin Hoods Bay (Ingham).

Var. *æruginosa* Hook.

Redmire, Wensleydale (Ingham).

Fruiting Winter and Spring, rarely.

2. *Metzgeria conjugata* Lindb.*(Jungermania furcata* var. *elongata* Hook.)

On rocks and trees in similar localities to the previous species, mostly amongst the hills, probably not uncommon.

Scawton Howle near Helmsley, fruiting (Spruce, 1841.)

Cronkley Gill, Eskdale (M.B.S., 1881).

Arncliffe wood, Eskdale (W. Ingham, 1897).

Near Bowes (Ingham).

Fruiting rarely.

3. *Metzgeria pubescens* Schrank.

(*Jungermania pubescens* Schrank.)

Moist shaded rocks, not uncommon in sub-alpine districts.

Hell Cleft, Teesdale (Spruce, 1843).

Rainton heights, Hambleton hills (Baker, 1854).

Goathland beck, amongst the eastern hills, and abundant on rocks at Rokeby, on the Tees and at Kisdon Scars, Upper Swaledale (M.B.S., 1890).

Peak Scar near Hawnby (J. A. Wheldon).

White Force, Teesdale, near Sedberg, and Bowes (Ingham).

Fruit never found.

SUB-ORDER II.—MARCHANTIACEÆ.

LUNULARIA Micheli.

1. *Lunularia vulgaris* Mich.

In damp places on wet roads or walks, and very often in gardens on the pots of greenhouse plants.

On damp walks in the Raywood, Castle Howard (Spruce, 1848).

On the ground on shaded road at Wigganthorpe (M.B.S., 1895).

Rarely fruiting, propagating itself by gemmiparous growth.

MARCHANTIA March. fil.

1. *Marchantia polymorpha* (L.)

Wet situations in shaded places, on damp walls, &c., very common.

Ganthorpe Broats and Oakwood, Castle Howard (Spruce, 1840).

In damp places near Malton, Scarbro', and near Wiggan-
thorpe, fruiting (M.B.S.)

Near Hawnby (J. A. Wheldon).

Fruiting Summer.

CONOCEPHALUS Neck.

1. *Conocephalus conicus* (Neck.) Dum.

(*Marchantia conica* L.)

Shady banks and ditches, by sides of mill ponds,
common.

Near Ganthorpe, and in Gilla Leys wood, Castle Howard,
fruiting abundantly (Spruce, 1837).

Saltergate Beck, fruiting (M.B.S., 1853).

On wet ditch sides near Old Malton (M.B.S.).

Near Northallerton (J. A. Wheldon).

Fruiting March, only rarely.

REBOULIA Raddi.

1. *Reboulia hemisphærica* Raddi.

(*Marchantia hemisphærica* L.)

On damp rocks in woods and shady places, not common.

Oak wood, Castle Howard (Spruce, 1846).

Ray wood, Castle Howard (R. Cross, 1876).

Roulston Scar and White Force, Teesdale (Ingham).

Fruiting Summer.

PREISSIA Corda.

1. *Preissia commutata* (Lindenb.) Nees.

(*Marchantia hemisphærica* L.)

Wet places on stones, &c., by streams, amongst the
hills, not uncommon.

Near Winch Bridge, and at the White Force Cronkley, Teesdale (Spruce, 1843).

Goathland Beck and Saltersgate Beck (M.B.S., 1863).

Coatham Marshes (W. Ingham, 1899).

Mallyan Spout and White Force, Teesdale (Ingham).

Fruiting Spring and Summer.

SUB-ORDER III.—RICCIACEÆ.

RICCIA Micheli.

1. *Riccia glauca* (L.)

On banks in moist places, not common.

Near York (G. Webster).

Strensall Common (W. Ingham, 1902).

Fruiting Spring.

RICCIELLA A. Braun.

1. *Ricciella fluitans* A. Braun.

(*Riccia fluitans* L.)

Ditches and stagnant waters, not common.

Ditches by the Foss at York (Spruce, 1843).

Askham Bog near York (J. A. Wheldon).

RICCIOCARPUS Corda.

1. *Ricciocarpus natans* Corda. (L.)

(*Riccia natans* L.)

Stagnant waters, not common.

Near York (W. West, 1879).

Gathered abundantly in brick ponds near Askham Bog, York, on the occasion of the Y.N.U. excursion, June 4, 1900 (M.B.S.)

Appleton Roebuck (Ingham).

SUB-ORDER IV.—ANTHOCEROTACEÆ.

ANTHOCEROS Micheli.

1. *Anthoceros punctatus* (L.)

Sides of ditches and in wet boggy places, rare or overlooked.

Near York, and in Terrington Car, Castle Howard (Spruce, 1842).

Fruiting Spring.



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